SHARP OPTONICA

SERVICE MANUAL

< PART I >

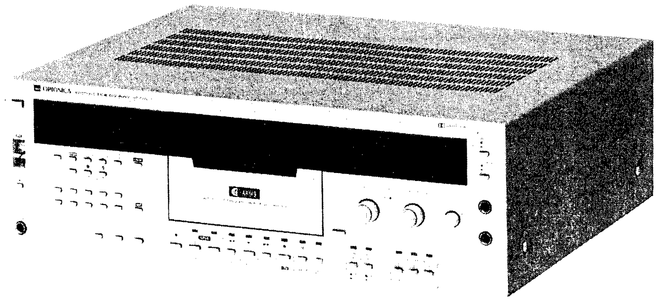

PHOTO: RT-7100H

ELECTRONIC TAPE PROCESSOR

MODEL
RT-7100H (Silver Panel)
RT-7100HB (Brown Panel)

APMS

Auto Programmable Music Selector

DOLBY SYSTEM ®

Noise reduction system manufactured under license from Dolby Laboratories.
"Dolby" and the double-D symbol are trademarks of Dolby Laboratories.

In the interests of user-safety the set should be restored to its original condition and only parts identical to those specified be used.

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SHARP CORPORATION OSAKA, JAPAN

SPECIFICATIONS

Electronic Tape Processor RT-7100H/HB

Power source:	AC 110/220/240 V, 50/60 Hz
Power consumption:	40 W
Semi-conductors:	1 LSI (Large Scale Integrated Circuit) 5 ICs (Integrated Circuit) 103 Transistors 107 Diodes 13 LEDs (Light Emitting Diode)
Dimensions:	width: 430 mm (16-15/16") height: 144 mm (5-11/16") depth: 371 mm (14-5/8")
Weight:	11.5 kg (25.4 lbs.)
Wow and flutter:	0.15% (DIN 45 500)
Frequency response:	Normal tape: 20 Hz to 15,000 Hz (DIN 45 500) Fe-Cr tape: 20 Hz to 18,000 Hz (DIN 45 500) MAXELL UDXLII tape: 20 Hz to 17,000 Hz (DIN 45 500)
S/N ratio:	Dolby NR off: 57 dB Dolby NR on: 67 dB (over 5 kHz)
Input sensitivity and input impedance:	Microphone: 0.2 mV/6.8K ohms Line: 63 mV/50K ohms Record/playback socket: 1 mV/K ohms
Output level and loaded impedance:	Headphones: 125 mV ("0" dB) 8 ohms Line: 1000 mV ("0" dB) 50K ohms Record/playback socket: 1000 mV ("0" dB) 50K ohms

* Specifications are subject to change without prior notice.

MAINS VOLTAGE SELECTION

Check the preset AC mains voltage before plugging the AC mains supply lead into an AC mains outlet. If the setting is different from that of your local mains supply voltage, the voltage selector must be re-set as follows.

Rotate the voltage selector by using a screwdriver so that your local voltage number can be seen in the window.

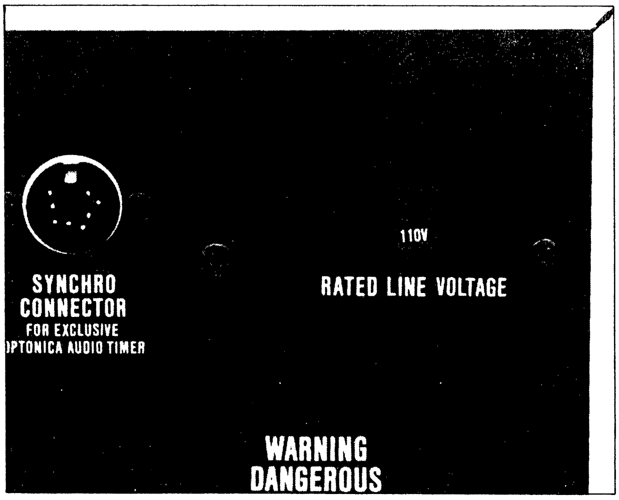


Figure 2–1

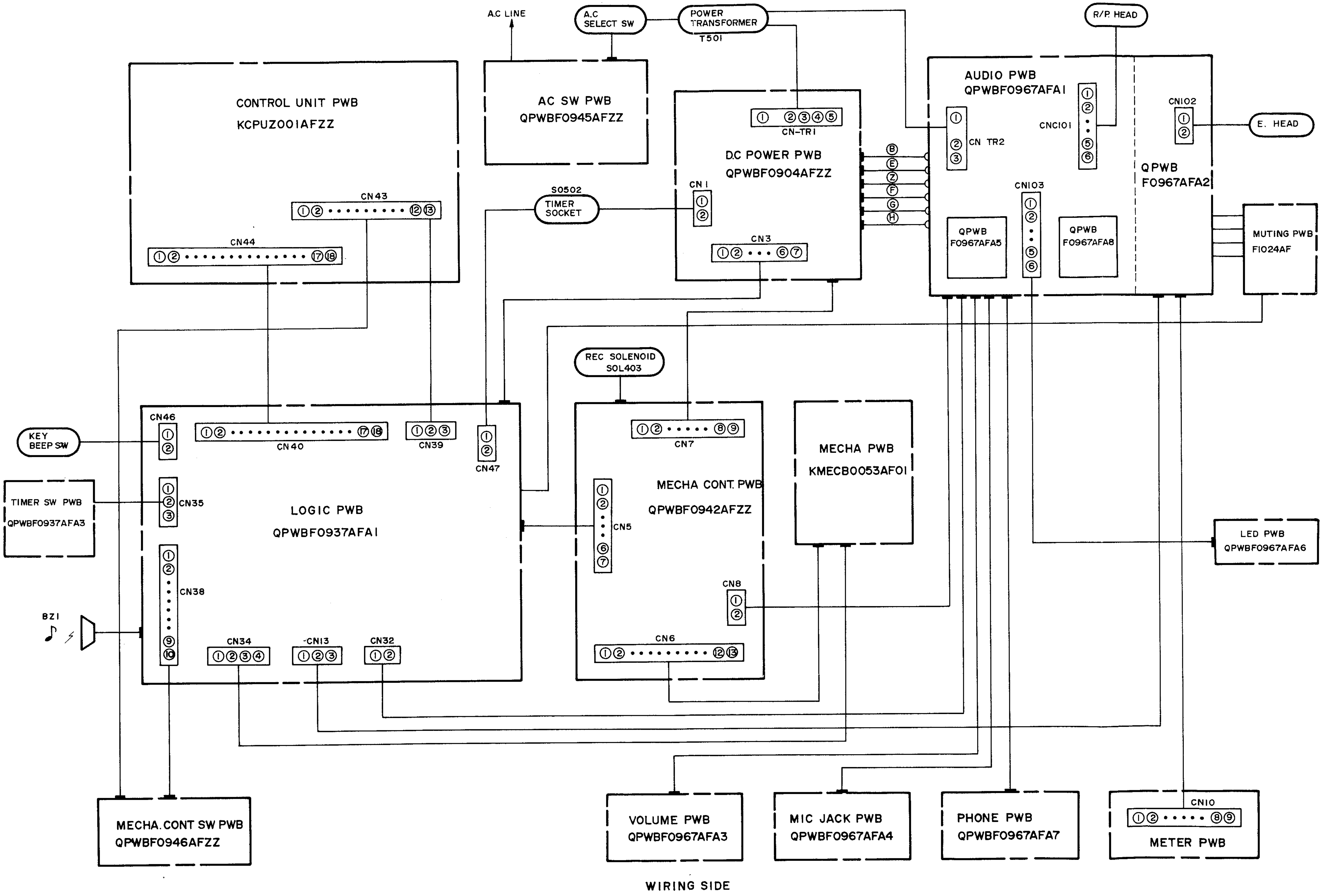

A.C LINE
A.C SELECT SW
POWER TRANSFORMER
T501
R/P. HEAD
CONTROL UNIT PWB
KCPUZ001AFZZ
CN43
①② • • • • • • • • • ⑫⑬
CN44
①② • • • • • • • • • • • • • • ⑰⑱
AC SW PWB
QPWBF0945AFZZ
①②③④⑤
CN-TR1
DC POWER PWB
QPWBF0904AFZZ
CN 1
①
②
CN3
①② • • • ⑥⑦
S0502
TIMER SOCKET
Ⓑ
Ⓔ
Ⓩ
Ⓕ
Ⓖ
Ⓗ
AUDIO PWB
QPWBF0967AFA1
①
②
③
CN TR2
CNC101
①
②
⑤
⑥
CN102
①
②
E. HEAD
Q PWB
F0967AFA2
CN103
①
②
⑤
⑥
QPWB
F0967AFA5
QPWB
F0967AFA8
MUTING PWB
F1024AF
REC SOLENOID
SOL403
KEY BEEP SW
CN46
①
②
①② • • • • • • • • • • • • • • ⑰⑱
CN40
①②③
CN39
①
②
CN47
TIMER SW PWB
QPWBF0937AFA3
①
②
③
CN35
LOGIC PWB
QPWBF0937AFA1
①
②
CN38
⑨
⑩
BZ1
CN34
①②③④
CN13
①②③
CN32
①②
①② • • • • • ⑧⑨
CN7
MECHA CONT. PWB
QPWBF0942AFZZ
①
②
CN5
⑥
⑦
CN8
①
②
CN6
①② • • • • • • • • • ⑫⑬
MECHA PWB
KMECB0053AF01
LED PWB
QPWBF0967AFA6
MECHA. CONT SW PWB
QPWBF0946AFZZ
VOLUME PWB
QPWBF0967AFA3
MIC JACK PWB
QPWBF0967AFA4
PHONE PWB
QPWBF0967AFA7
CN10
①② • • • • • ⑧⑨
METER PWB
WIRING SIDE

Figure 3 BLOCK DIAGRAM (P.W. BOARD)

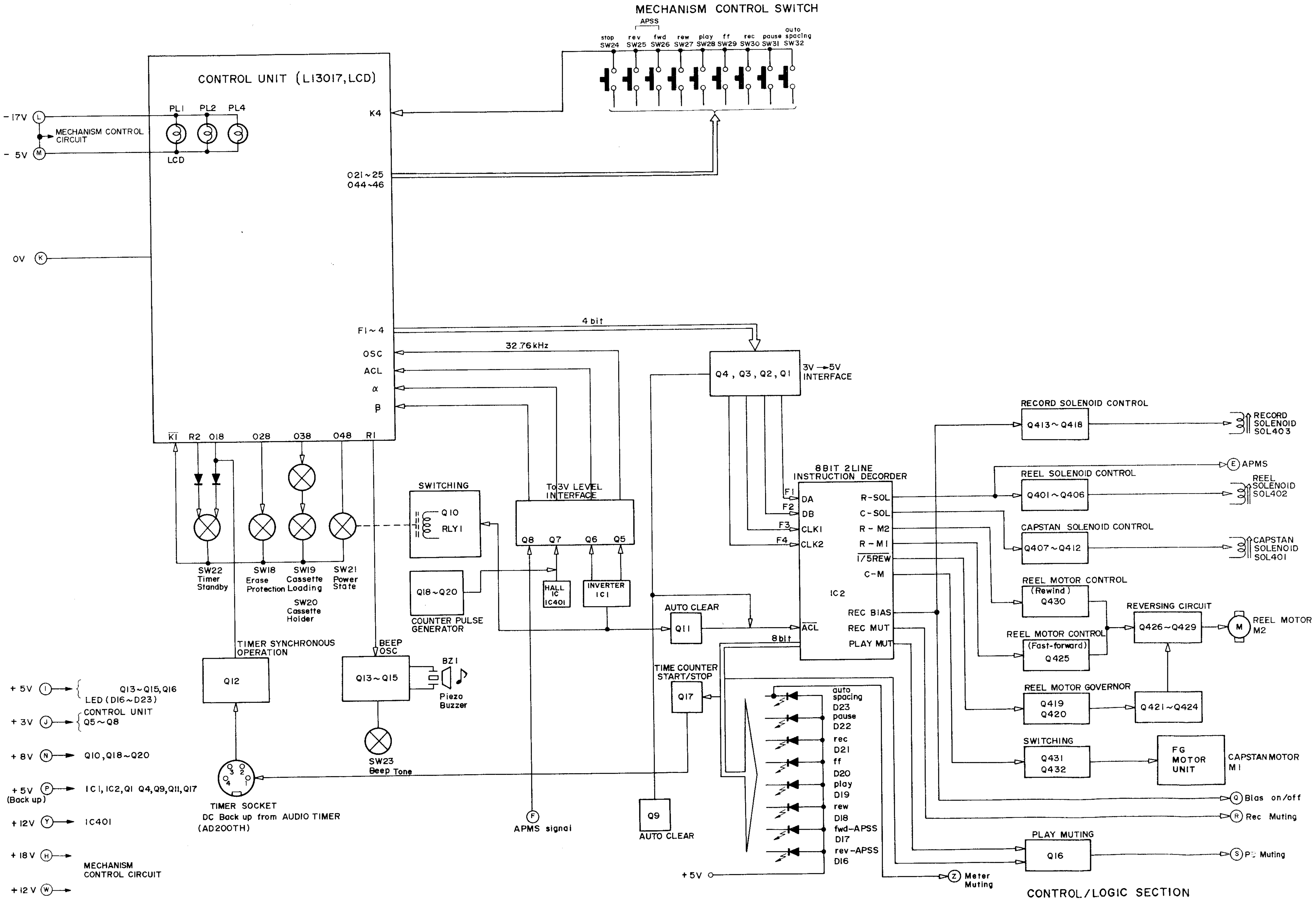

MECHANISM CONTROL SWITCH
APSS
stop SW24
rev SW25
fwd SW26
rew SW27
play SW28
ff SW29
rec SW30
pause SW31
auto spacing SW32
CONTROL UNIT (LI3017,LCD)
PL1
PL2
PL4
LCD
K4
021~25
044~46
-17V Ⓛ
-5V Ⓜ
MECHANISM CONTROL CIRCUIT
0V Ⓚ
F1~4
4 bit
OSC
32.76kHz
ACL
α
β
K1
R2
018
028
038
048
R1
Q4, Q3, Q2, Q1
3V →5V INTERFACE
RECORD SOLENOID CONTROL
Q413~Q418
RECORD SOLENOID SOL403
Ⓔ APMS
REEL SOLENOID CONTROL
Q401~Q406
REEL SOLENOID SOL402
8BIT 2LINE INSTRUCTION DECORDER
F1
F2
F3
F4
DA
DB
CLK1
CLK2
R-SOL
C-SOL
R-M2
R-M1
1/5REW
C-M
IC2
REC BIAS
REC MUT
PLAY MUT
ACL
8bit
CAPSTAN SOLENOID CONTROL
Q407~Q412
CAPSTAN SOLENOID SOL401
REEL MOTOR CONTROL
(Rewind)
Q430
REVERSING CIRCUIT
Q426~Q429
M
REEL MOTOR M2
REEL MOTOR CONTROL
(Fast-forward)
Q425
REEL MOTOR GOVERNOR
Q419
Q420
Q421~Q424
SWITCHING
Q431
Q432
FG MOTOR UNIT
CAPSTAN MOTOR M1
Ⓠ Bias on/off
Ⓡ Rec Muting
PLAY MUTING
Q16
Ⓢ P. Muting
Ⓩ Meter Muting
CONTROL/LOGIC SECTION
SWITCHING
Q10
RLY1
To 3V LEVEL INTERFACE
Q8
Q7
Q6
Q5
Q18~Q20
COUNTER PULSE GENERATOR
HALL IC IC401
INVERTER IC1
AUTO CLEAR
Q11
TIME COUNTER START/STOP
Q17
Q9
AUTO CLEAR
+5V
auto spacing D23
pause D22
rec D21
ff D20
play D19
rew D18
fwd-APSS D17
rev-APSS D16
SW22 Timer Standby
SW18 Erase Protection
SW19 Cassette Loading
SW21 Power State
SW20 Cassette Holder
TIMER SYNCHRONOUS OPERATION
BEEP OSC
Q12
Q13~Q15
BZ1
Piezo Buzzer
SW23 Beep Tone
TIMER SOCKET
DC Back up from AUDIO TIMER (AD200TH)
Ⓕ APMS signal
+5V Ⓘ Q13~Q15,Q16 LED (D16~D23)
+3V Ⓙ CONTROL UNIT Q5~Q8
+8V Ⓝ Q10,Q18~Q20
+5V Ⓟ (Back up) IC1,IC2,Q1 Q4,Q9,Q11,Q17
+12V Ⓨ IC401
+18V Ⓗ
+12V Ⓦ
MECHANISM CONTROL CIRCUIT

Figure 5 BLOCK DIAGRAM (TAPE DECK CONTROL SECTION)

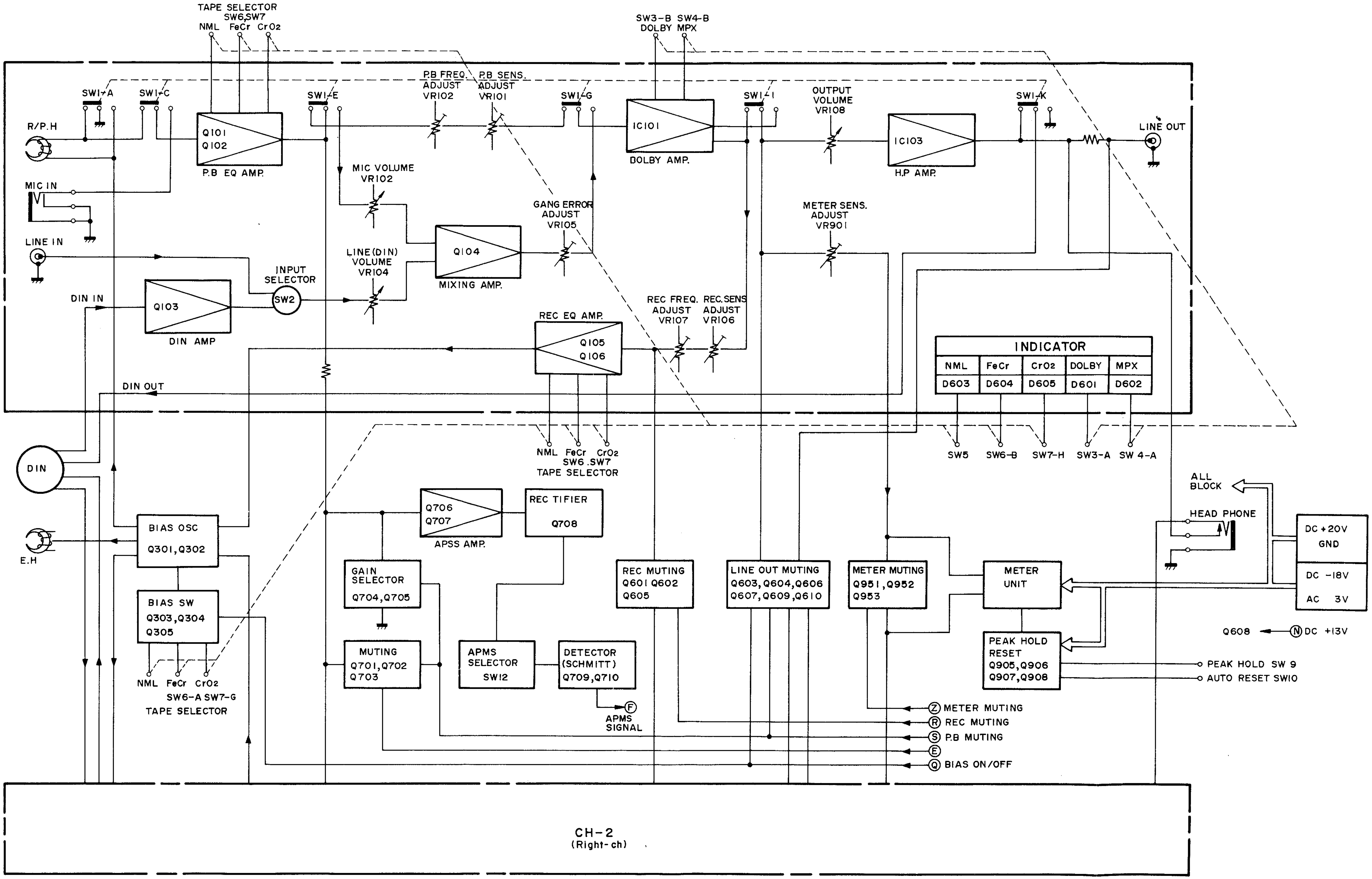
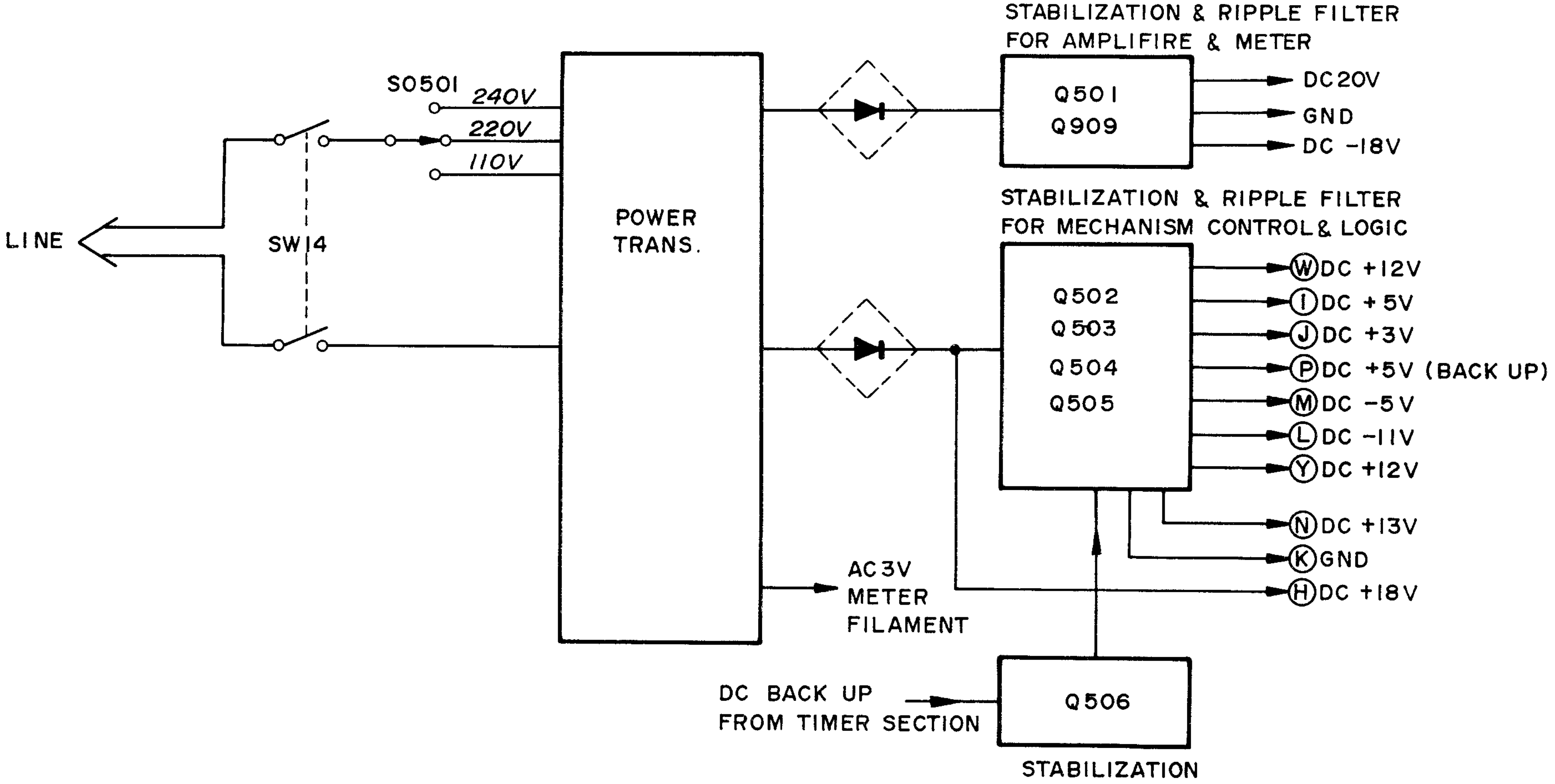

TAPE SELECTOR
SW6,SW7
NML FeCr CrO2
SW3-B SW4-B
DOLBY MPX
SW1-A
SW1-C
SW1-E
P.B FREQ. ADJUST VR102
P.B SENS. ADJUST VR101
SW1-G
SW1-I
OUTPUT VOLUME VR108
SW1-K
R/P.H
Q101
Q102
P.B EQ AMP.
IC101
DOLBY AMP.
IC103
H.P AMP.
LINE OUT
MIC IN
MIC VOLUME VR102
GANG ERROR ADJUST VR105
METER SENS. ADJUST VR901
LINE IN
LINE(DIN) VOLUME VR104
Q104
MIXING AMP.
INPUT SELECTOR
SW2
DIN IN
Q103
DIN AMP
REC FREQ. ADJUST VR107
REC.SENS ADJUST VR106
REC EQ AMP.
Q105
Q106
INDICATOR
NML
FeCr
CrO2
DOLBY
MPX
D603
D604
D605
D601
D602
DIN OUT
NML FeCr CrO2
SW6 .SW7
TAPE SELECTOR
SW5
SW6-B
SW7-H
SW3-A
SW 4-A
DIN
ALL BLOCK
Q706
Q707
APSS AMP.
REC TIFIER
Q708
HEAD PHONE
DC +20V
GND
DC -18V
AC 3V
E.H
BIAS OSC
Q301,Q302
GAIN SELECTOR
Q704,Q705
REC MUTING
Q601 Q602
Q605
LINE OUT MUTING
Q603,Q604,Q606
Q607,Q609,Q610
METER MUTING
Q951,Q952
Q953
METER UNIT
BIAS SW
Q303,Q304
Q305
Q608
Ⓝ DC +13V
MUTING
Q701,Q702
Q703
APMS SELECTOR
SW12
DETECTOR
(SCHMITT)
Q709,Q710
PEAK HOLD
RESET
Q905,Q906
Q907,Q908
PEAK HOLD SW 9
AUTO RESET SW10
NML FeCr CrO2
SW6-A SW7-G
TAPE SELECTOR
Ⓕ
APMS SIGNAL
Ⓩ METER MUTING
Ⓡ REC MUTING
Ⓢ P.B MUTING
Ⓔ
Ⓠ BIAS ON/OFF
CH-2
(Right-ch)

Figure 7 BLOCK DIAGRAM (TAPE DECK AUDIO SECTION)


LINE
SW14
SO501
240V
220V
110V
POWER TRANS.
AC3V METER FILAMENT
STABILIZATION & RIPPLE FILTER FOR AMPLIFIRE & METER
Q501
Q909
DC20V
GND
DC -18V
STABILIZATION & RIPPLE FILTER FOR MECHANISM CONTROL & LOGIC
Q502
Q503
Q504
Q505
ⓦ DC +12V
Ⓘ DC +5V
Ⓙ DC +3V
Ⓟ DC +5V (BACK UP)
Ⓜ DC -5V
Ⓛ DC -11V
Ⓨ DC +12V
Ⓝ DC +13V
Ⓚ GND
Ⓗ DC +18V
DC BACK UP FROM TIMER SECTION
Q506
STABILIZATION

POWER SUPPLY

Figure 9 BLOCK DIAGRAM (POWER SUPPLY SECTION)

OTES; <TAPE DECK CONTROL SECTION>

. SW18 : Erase protection switch shown in "off" position.
. SW19 : Cassette loading switch shown in "off" position.
. SW20 : Cassette holder switch shown in "on" position.
. SW21 : Power state switch shown in "off" position.
. SW22 : Timer standby switch shown in "off" position.
. SW23 : Beep tone switch shown in "off" position.
. SW24 : Stop switch shown in "off" position.
. SW25 : APSS reverse switch shown in "off" position.
. SW26 : APSS forward switch shown in "off" position.
0. SW27 : Rewind switch shown in "off" position.
1. SW28 : Play switch shown in "off" position.
2. SW29 : Fast forward switch shown in "off" position.
3. SW30 : Record switch shown in "off" position.
4. SW31 : Pause switch shown in "off" position.
5. SW32 : Auto spacing switch shown in "off" position.
6. Capacitance values are in MFD, P = MMFD.
    * (ML) : Mylar type, (LR) : Low reek type
7. Resistance values are in ohm, K = 1000, M = 1000K.
8. Voltage readings are measure with VTVM under no signal input. —→ Play mode.
    * ⬭ : Fast-forward mode
9. Specifications or wiring diagrams of this model are subject to change for the improvement without prior notice.

NOTES; <TAPE DECK AUDIO SECTION>

1. SW1 : Record/Playback switch shown in "play" position.
2. SW2 : Input selector switch shown in "LINE" position.
3. SW3 : Dolby NR switch shown in "off" position.
4. SW4 : FM Multiplex filter switch shown in "off" position.
5. SW5 : Tape selector (normal) switch shown in "on" position.
6. SW6 : Tape selector (Fe-Cr) switch shown in "off" position.
7. SW7 : Tape selector (Cr-O$_2$) switch shown in "off" position.
8. SW9 : Peak hold switch shown in "off" position.
9. SW10 : Auto reset switch shown in "off" position.
10. SW12 : Discharge switch shown in "off" position.
11. SW14 : Power switch shown in "off" position.
12. Capacitance values are in MFD, P = MMFD.
    * (ML) : Mylar type, (P) : Polypropylene type,
    (LR) : Low reek type.
13. Resistance values are in ohm, K = 1000, M = 1000K.
14. Voltage readings are measure with VTVM under no signal input.
    Measuring conditions
    Mechanism : stop (or Record/Play for parethesized values)
    Dolby NR switch : on, FM Multiplex filter switch : on,
    Tape selector switch : normal, Peak hold switch : off,
    Auto reset switch : off.
15. Specifications or wiring diagrams of this model are subject to change for the improvement without prior notice.

Be sure to use regular parts for securing the safety and reliability of the set. Parts marked with " ⚠ " and parts crosshatched (in black) are especially important for maintaining the safety and protecting ability of the set. Be sure to replace them with parts of specified parts number.

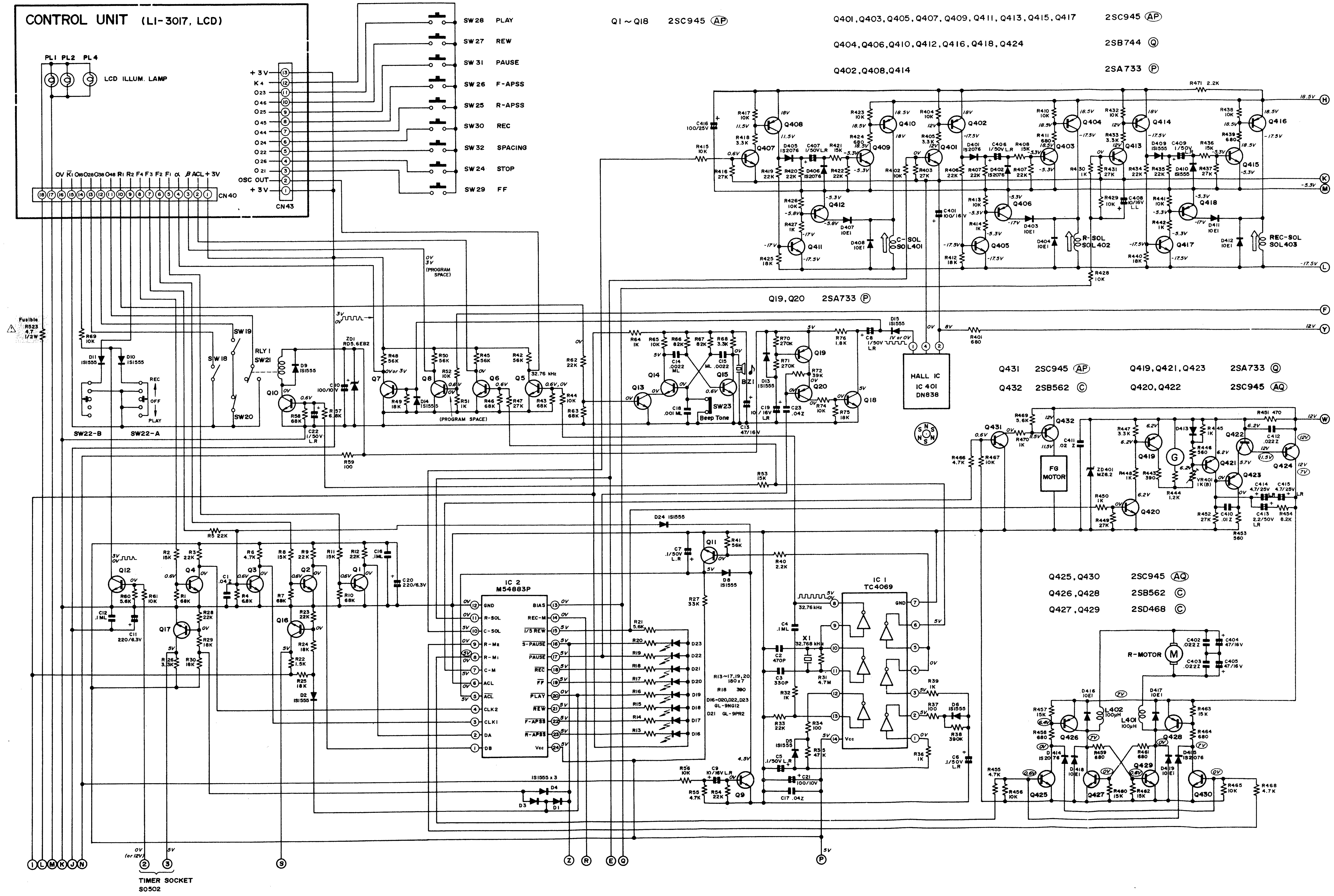
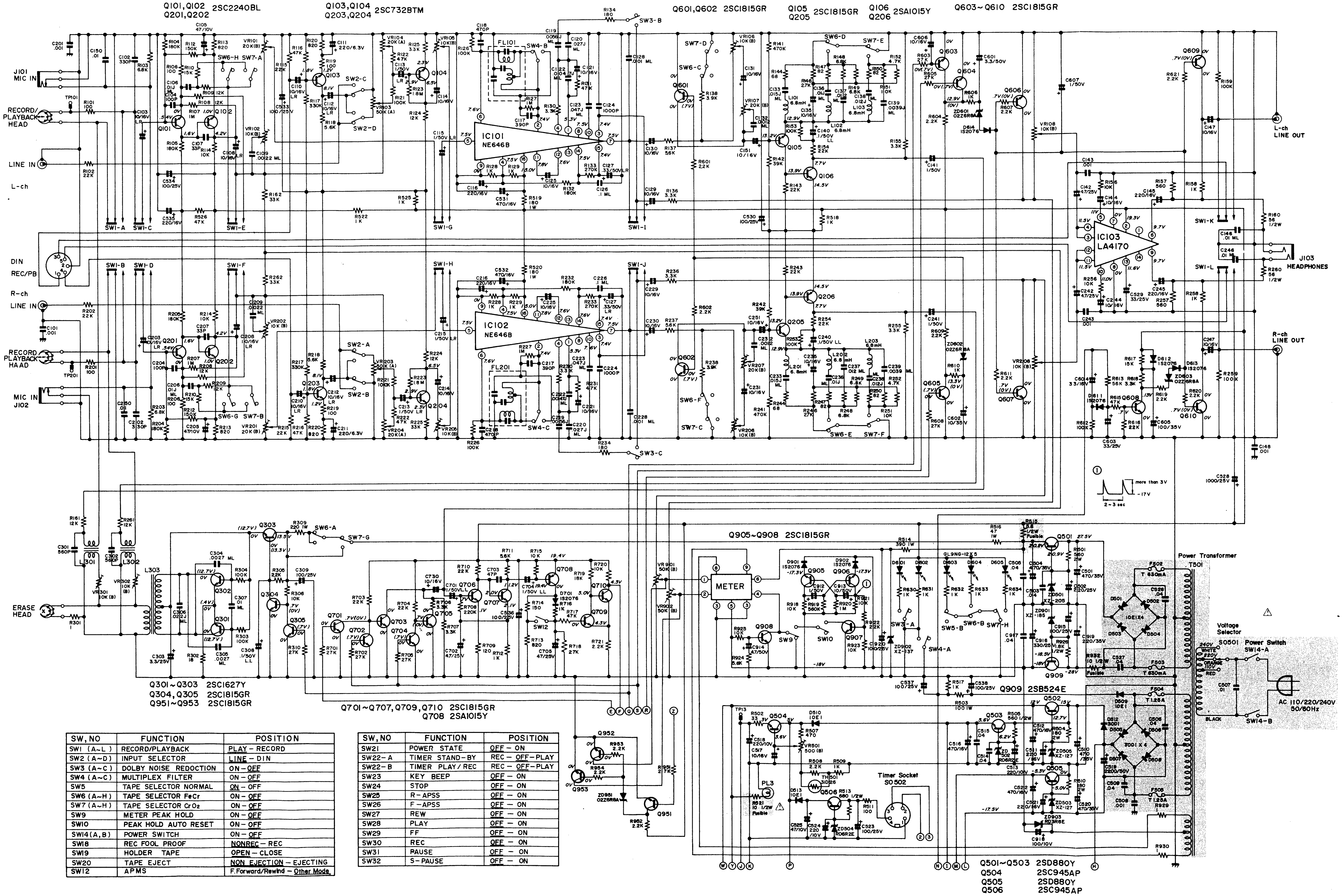

CONTROL UNIT (LI-3017, LCD)
PL1 PL2 PL4
LCD ILLUM. LAMP
CN40
CN43
OSC OUT
SW28 PLAY
SW27 REW
SW31 PAUSE
SW26 F-APSS
SW25 R-APSS
SW30 REC
SW32 SPACING
SW24 STOP
SW29 FF
Q1～Q18 2SC945 (AP)
Q401, Q403, Q405, Q407, Q409, Q411, Q413, Q415, Q417 2SC945 (AP)
Q404, Q406, Q410, Q412, Q416, Q418, Q424 2SB744 (Q)
Q402, Q408, Q414 2SA733 (P)
Q19, Q20 2SA733 (P)
Q431 2SC945 (AP)
Q432 2SB562 (C)
Q419, Q421, Q423 2SA733 (Q)
Q420, Q422 2SC945 (AQ)
Q425, Q430 2SC945 (AQ)
Q426, Q428 2SB562 (C)
Q427, Q429 2SD468 (C)
C-SOL SOL401
R-SOL SOL402
REC-SOL SOL403
HALL IC IC 401 DN838
FG MOTOR
R-MOTOR
IC 2 M54883P
IC 1 TC4069
X1 32.768 kHz
Beep Tone
SW22-B
SW22-A
SW18
SW19
SW20
SW21
RLY1
SW23
(PROGRAM SPACE)
Fusible R523 4.7 1/2W
TIMER SOCKET SO502

Figure 11 SCHEMATIC DIAGRAM (TAPE DECK CONTROL SECTION)


Q101,Q102 2SC2240BL
Q201,Q202
Q103,Q104 2SC732BTM
Q203,Q204
Q601,Q602 2SC1815GR
Q105 2SC1815GR
Q205
Q106 2SA1015Y
Q206
Q603~Q610 2SC1815GR
J101 MIC IN
RECORD/PLAYBACK HEAD
LINE IN
L-ch
DIN REC/PB
R-ch LINE IN
RECORD/PLAYBACK HAAD
MIC IN J102
IC101 NE646B
IC102 NE646B
IC103 LA4170
FL101
FL201
L-ch LINE OUT
J103 HEADPHONES
R-ch LINE OUT
ERASE HEAD
METER
Q905~Q908 2SC1815GR
Q301~Q303 2SC1627Y
Q304,Q305 2SC1815GR
Q951~Q953 2SC1815GR
Q701~Q707,Q709,Q710 2SC1815GR
Q708 2SA1015Y
Q909 2SB524E
Power Transformer T501
Voltage Selector S0501
Power Switch SW14-A
SW14-B
AC 110/220/240V 50/60Hz
Timer Socket S0502
PL3
more than 3V
-17V
2~3 sec
Q501~Q503 2SD880Y
Q504 2SC945AP
Q505 2SD880Y
Q506 2SC945AP

SW, NO	FUNCTION	POSITION
SW1 (A~L)	RECORD/PLAYBACK	PLAY – RECORD
SW2 (A~D)	INPUT SELECTOR	LINE – DIN
SW3 (A~C)	DOLBY NOISE REDOCTION	ON – OFF
SW4 (A~C)	MULTIPLEX FILTER	ON – OFF
SW5	TAPE SELECTOR NORMAL	ON – OFF
SW6 (A~H)	TAPE SELECTOR FeCr	ON – OFF
SW7 (A~H)	TAPE SELECTOR CrO₂	ON – OFF
SW9	METER PEAK HOLD	ON – OFF
SW10	PEAK HOLD AUTO RESET	ON – OFF
SW14 (A, B)	POWER SWITCH	ON – OFF
SW18	REC FOOL PROOF	NONREC – REC
SW19	HOLDER TAPE	OPEN – CLOSE
SW20	TAPE EJECT	NON EJECTION – EJECTING
SW12	APMS	F.Forward/Rewind – Other Mode

SW, NO	FUNCTION	POSITION
SW21	POWER STATE	OFF – ON
SW22-A	TIMER STAND-BY	REC – OFF – PLAY
SW22-B	TIMER PLAY/REC	REC – OFF – PLAY
SW23	KEY BEEP	OFF – ON
SW24	STOP	OFF – ON
SW25	R-APSS	OFF – ON
SW26	F-APSS	OFF – ON
SW27	REW	OFF – ON
SW28	PLAY	OFF – ON
SW29	FF	OFF – ON
SW30	REC	OFF – ON
SW31	PAUSE	OFF – ON
SW32	S-PAUSE	OFF – ON

Figure 13 SCHEMATIC DIAGRAM (TAPE DECK AUDIO SECTION)

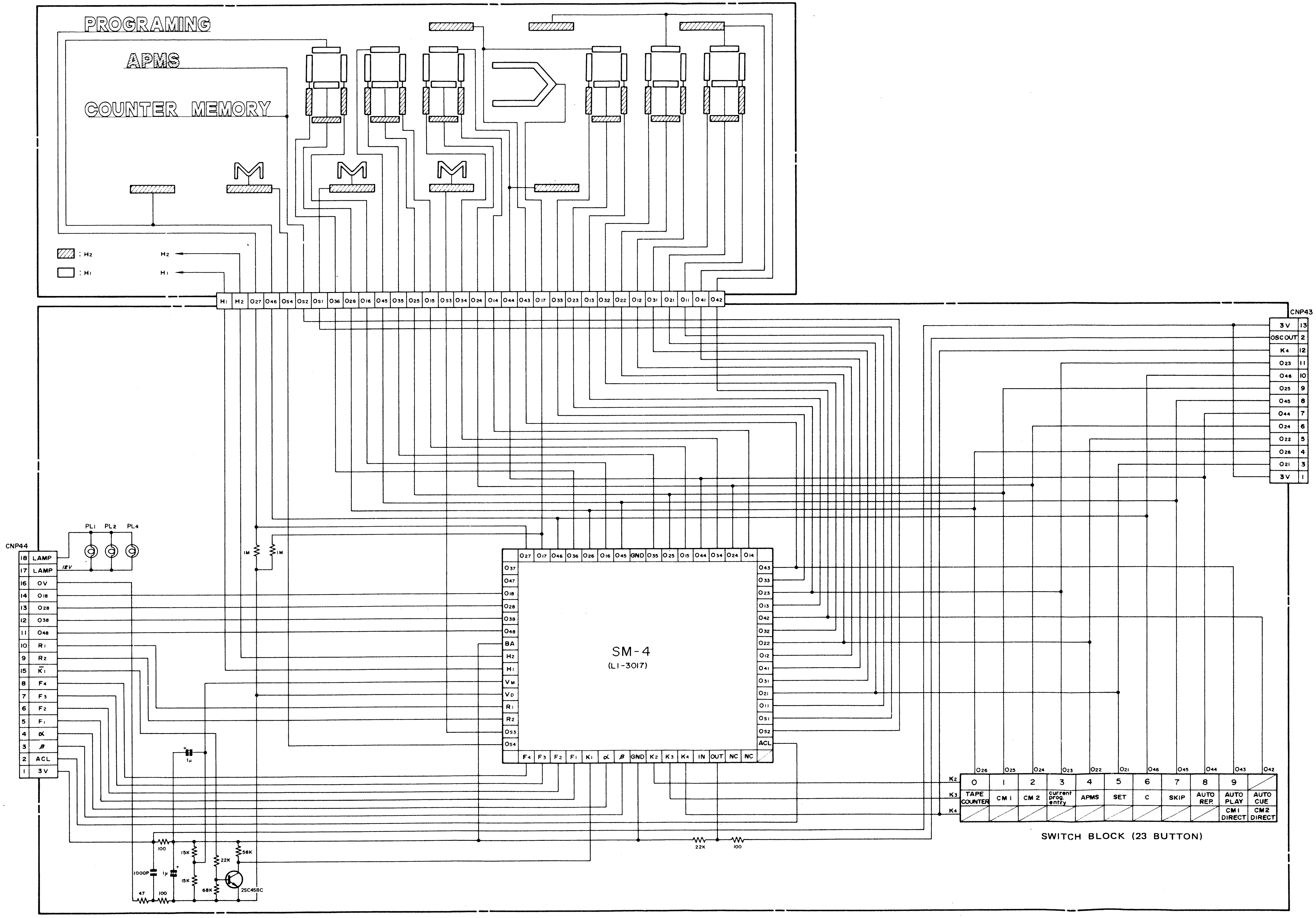

PROGRAMING
APMS
COUNTER MEMORY
▨ : H2
☐ : H1
H2
H1
CNP43
CNP44
PL1 PL2 PL4
SM-4
(LI-3017)
2SC458C
TAPE COUNTER
CM 1
CM 2
current prog. entry
APMS
SET
C
SKIP
AUTO REP.
AUTO PLAY
AUTO CUE
CM1 DIRECT
CM2 DIRECT
SWITCH BLOCK (23 BUTTON)

Figure 15 SCHEMATIC DIAGRAM (MICROPROCESSOR-CONTROLLED UNIT)

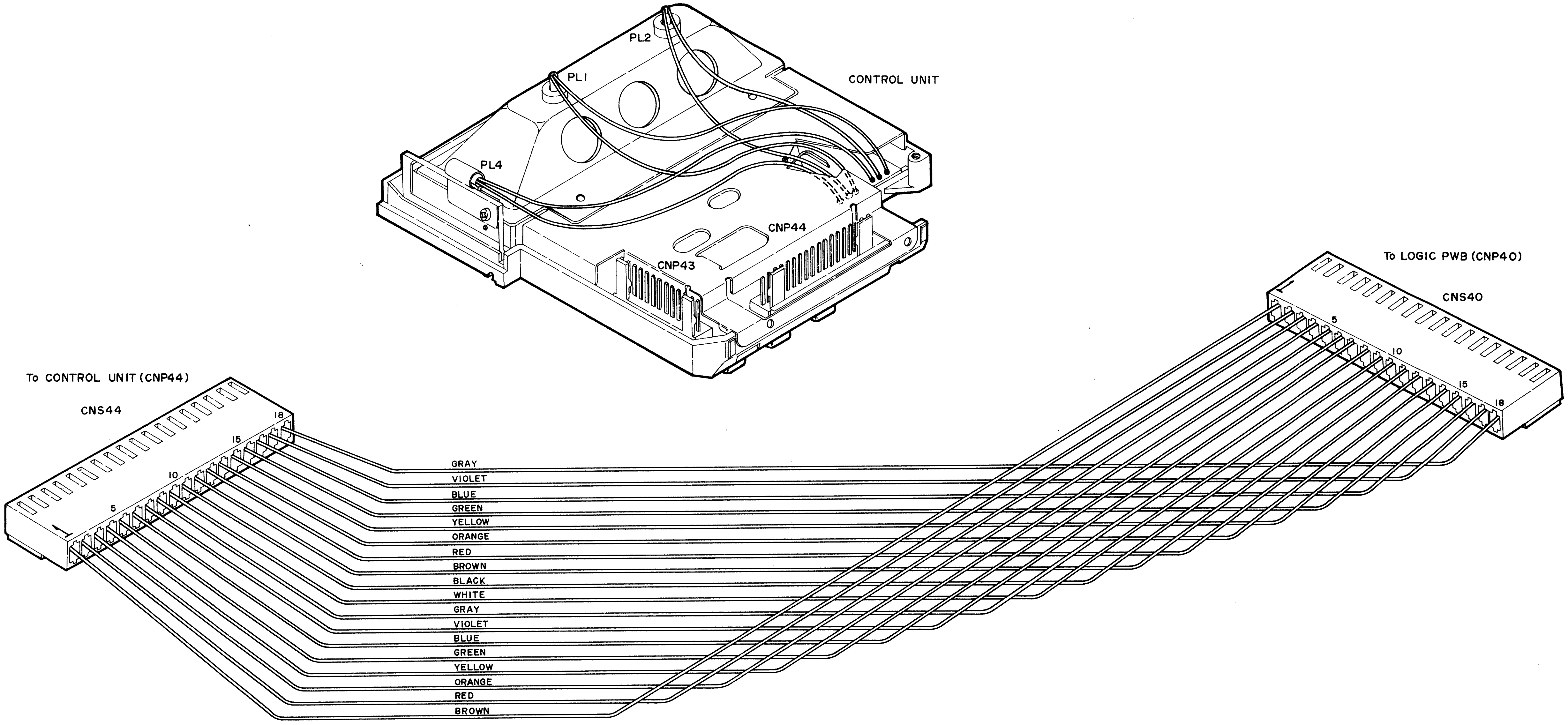

PL2
PL1
CONTROL UNIT
PL4
CNP44
CNP43
To LOGIC PWB (CNP40)
CNS40
1
5
10
15
18
To CONTROL UNIT (CNP44)
CNS44
18
15
10
5
1
GRAY
VIOLET
BLUE
GREEN
YELLOW
ORANGE
RED
BROWN
BLACK
WHITE
GRAY
VIOLET
BLUE
GREEN
YELLOW
ORANGE
RED
BROWN

Figure 17 WIRING CONNECTION OF MICROPROCESSOR-CONTROLLED UNIT

NOTES

- CNP13 : From MAIN PWB
- CNP32 : From MAIN PWB
- CNP34 : From MECHANISM SWITCHES (CNS34)
- CNP35 : From TIMER STANDBY SWITCH (CNS35)
- CNP38 : From MECHANISM CONTROL LED PWB (CNS38)
- CNP39 : From CONTROL UNIT (CNS39)
- CNP40 : From CONTROL UNIT (CNS40)
- CNP46 : From BEEP TONE SWITCH (CNS46)
- CNP47 : From TIMER SOKET (CNS47)

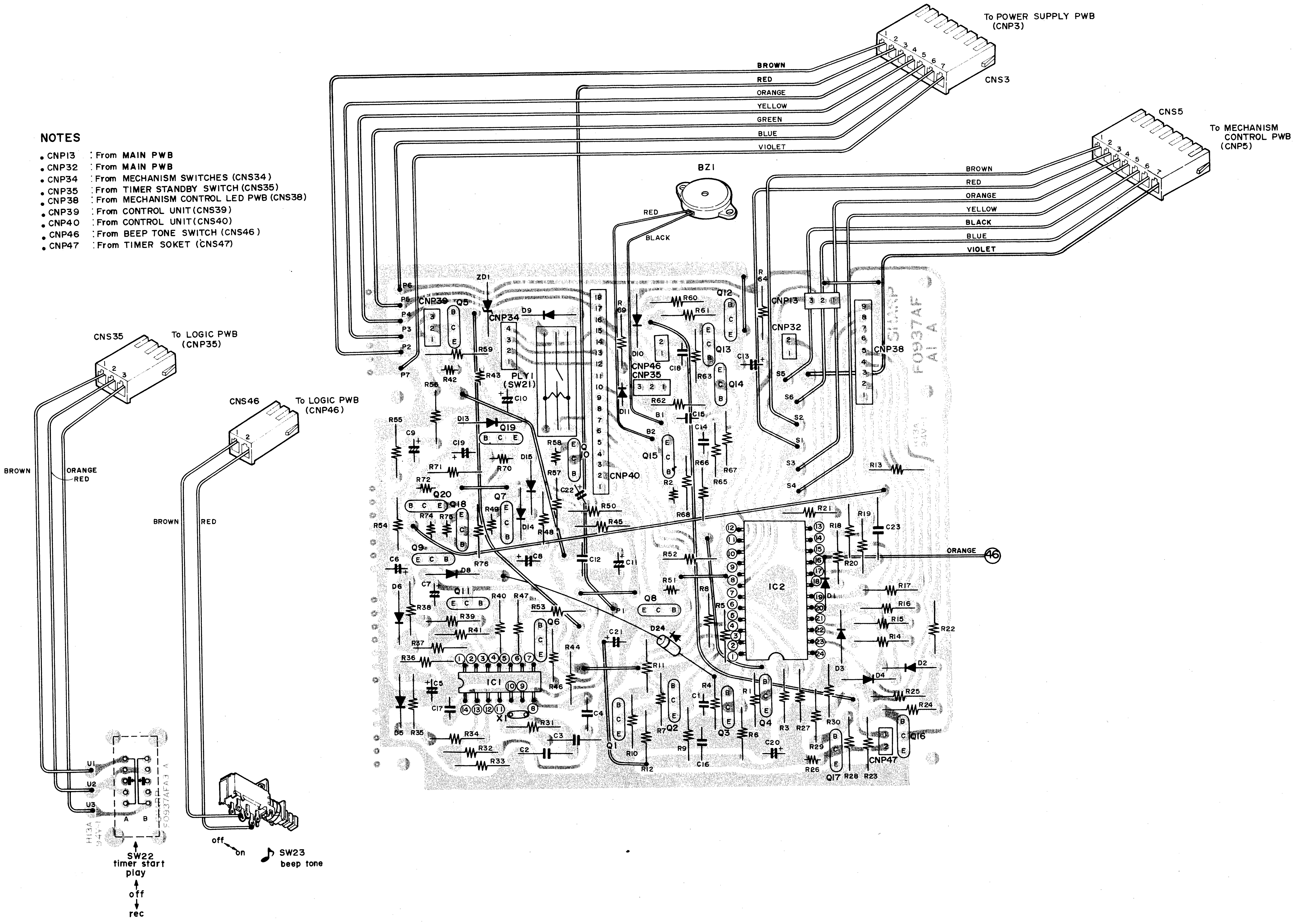

To POWER SUPPLY PWB (CNP3)
CNS3
BROWN
RED
ORANGE
YELLOW
GREEN
BLUE
VIOLET
CNS5
To MECHANISM CONTROL PWB (CNP5)
BROWN
RED
ORANGE
YELLOW
BLACK
BLUE
VIOLET
BZ1
RED
BLACK
CNS35
To LOGIC PWB (CNP35)
CNS46
To LOGIC PWB (CNP46)
BROWN
ORANGE
RED
BROWN
RED
ORANGE
46
CNP39
CNP34
CNP40
CNP13
CNP32
CNP38
CNP46
CNP35
CNP47
PLY1 (SW21)
IC1
IC2
X1
ZD1
P1
P2
P3
P4
P5
P6
P7
S1
S2
S3
S4
S5
S6
B1
B2
U1
U2
U3
A
B
F0937AF A1 A
SW22
timer start
play
off
rec
off
on
SW23
beep tone

Figure 19 WIRING SIDE OF P.W. BOARD (LOGIC)

NOTES

- CNP13 : From MAIN PWB
- CNP32 : From MAIN PWB
- CNP34 : From MECHANISM SWITCHES (CNS34)
- CNP35 : From TIMER STANDBY SWITCH (CNS35)
- CNP38 : From MECHANISM CONTROL LED PWB (CNS38)
- CNP39 : From CONTROL UNIT (CNS39)
- CNP40 : From CONTROL UNIT (CNS40)
- CNP46 : From BEEP TONE SWITCH (CNS46)
- CNP47 : From TIMER SOKET (CNS47)

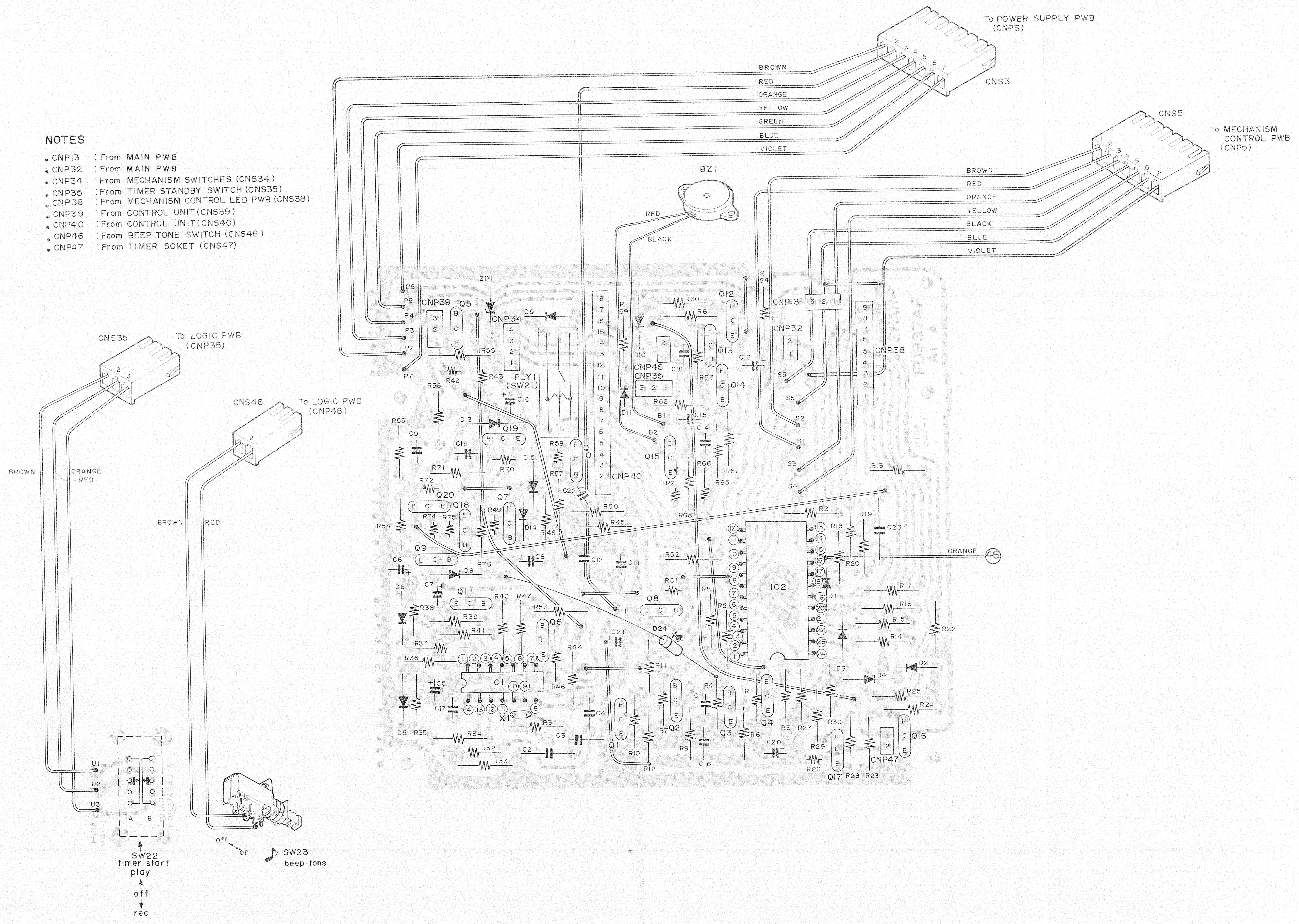
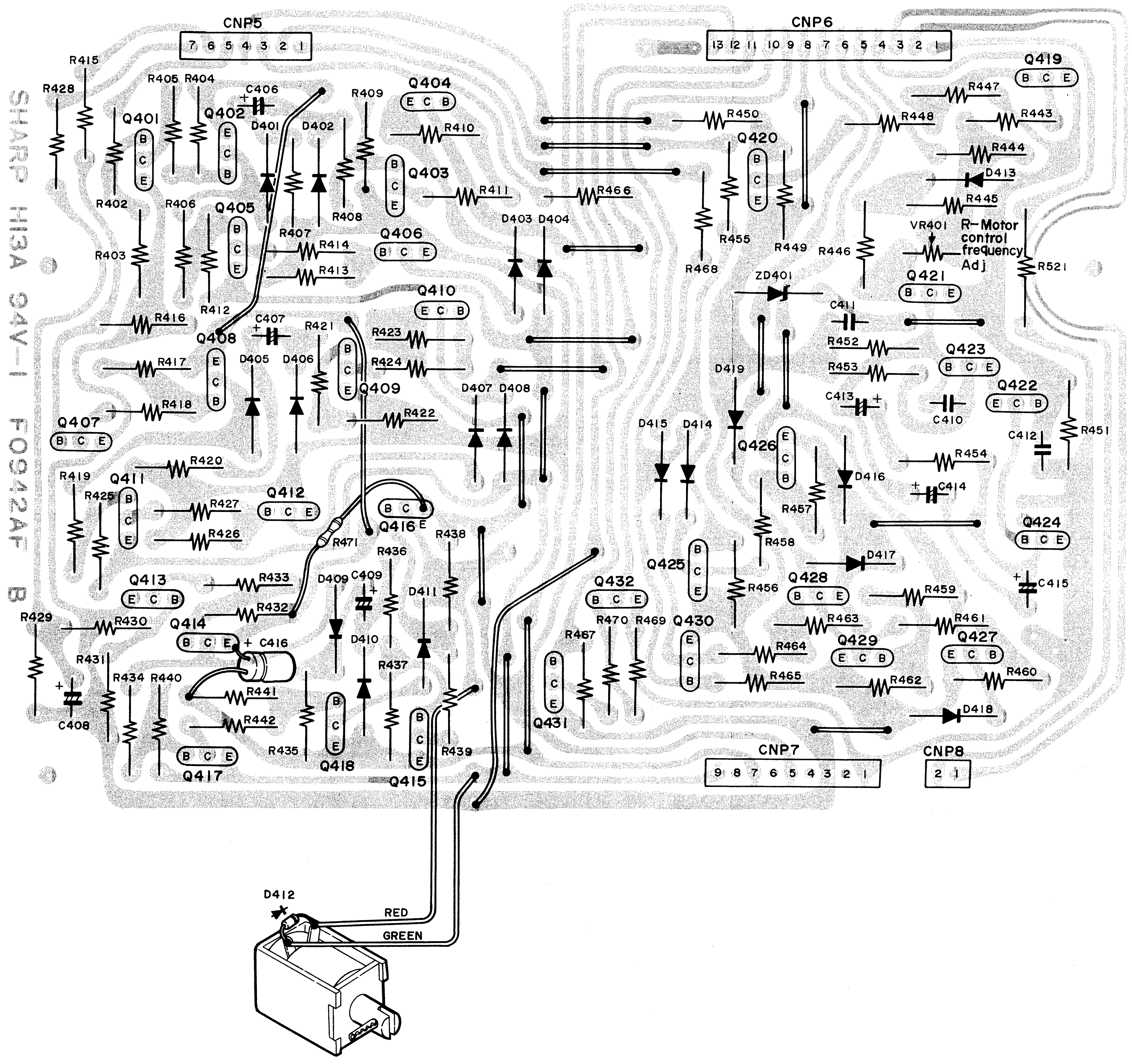

To POWER SUPPLY PWB (CNP3)
CNS3
BROWN
RED
ORANGE
YELLOW
GREEN
BLUE
VIOLET
CNS5
To MECHANISM CONTROL PWB (CNP5)
BROWN
RED
ORANGE
YELLOW
BLACK
BLUE
VIOLET
BZ1
RED
BLACK
CNS35
To LOGIC PWB (CNP35)
CNS46
To LOGIC PWB (CNP46)
BROWN
ORANGE
RED
BROWN
RED
CNP39
CNP34
CNP40
CNP46
CNP35
CNP13
CNP32
CNP38
CNP47
PLY1 (SW21)
IC1
IC2
X1
ZD1
SHARP F0937AF A1 A
H13A 94V-1
ORANGE
46
U1
U2
U3
A
B
SW22
timer start
play
off
rec
off
on
SW23
beep tone

Figure 19 WIRING SIDE OF P.W. BOARD (LOGIC)

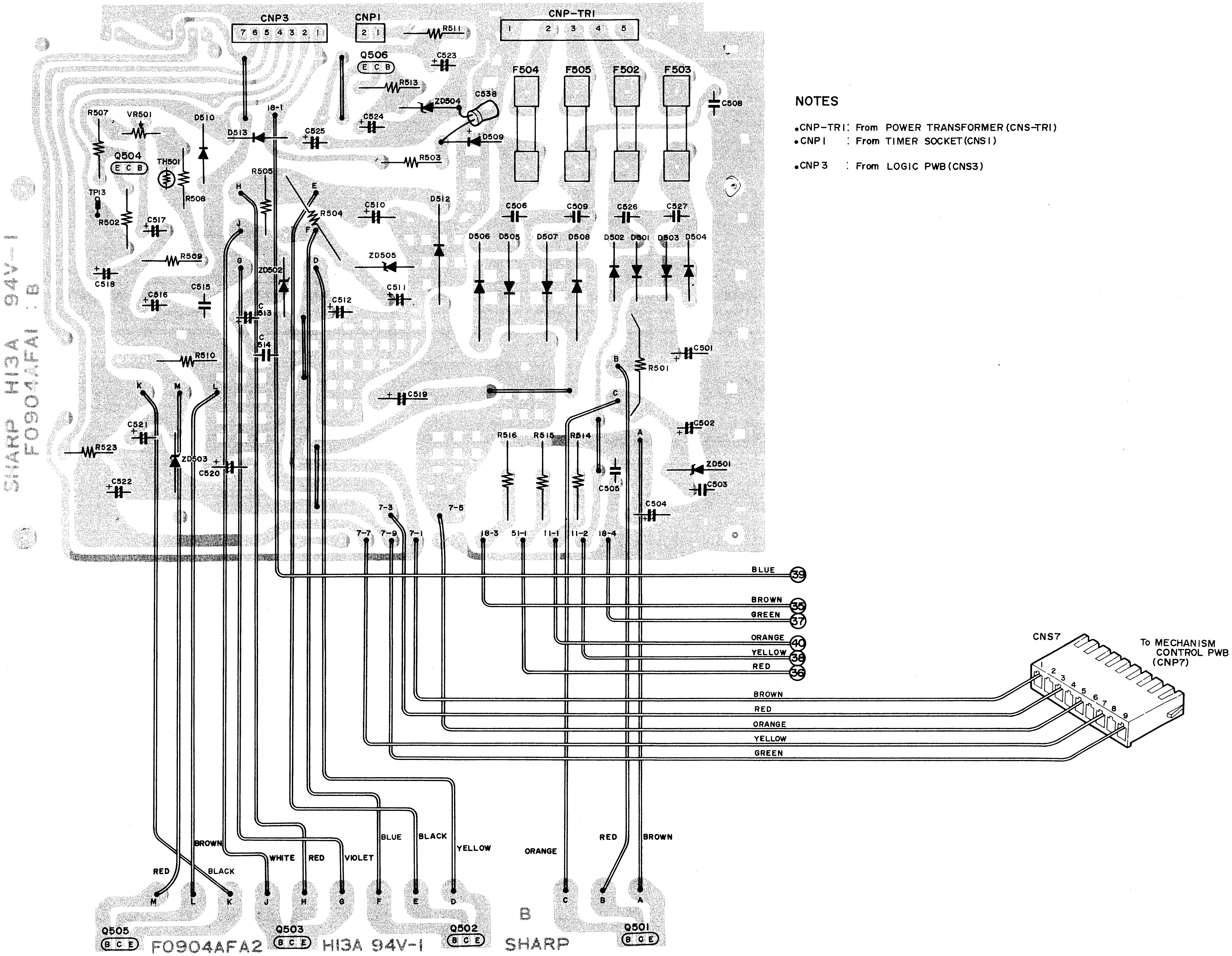

CNP5
7 6 5 4 3 2 1
CNP6
13 12 11 10 9 8 7 6 5 4 3 2 1
CNP7
9 8 7 6 5 4 3 2 1
CNP8
2 1
SHARP HI3A 94V-1 F0942AF B
R415 R428 R405 R404 C406 R409 Q401 Q402 D401 D402 Q404 R410 Q403 R411 R466 R408 R402 R406 Q405 R407 R414 R413 Q406 D403 D404 R403 R412 R416 C407 Q408 R421 Q410 R423 R424 Q409 D405 D406 R417 R418 Q407 R422 D407 D408 R420 R419 R425 Q411 R427 R426 Q412 Q416 R471 R438 R436 Q413 R433 R432 D409 C409 D411 R429 R430 Q414 C416 D410 R431 R434 R440 R441 R437 R442 R435 Q417 Q418 Q415 R439 C408
R450 R448 R447 Q419 R443 Q420 R444 D413 R445 VR401 R-Motor control frequency Adj R455 R449 R446 R468 R521 Q421 ZD401 C411 R452 R453 Q423 D419 C413 C410 Q422 D415 D414 Q426 C412 R451 R454 D416 C414 R457 Q424 R458 D417 Q425 R456 Q428 R459 C415 Q432 R461 R463 R470 R469 Q430 R467 Q429 Q427 R464 R465 R462 R460 Q431 D418
B C E
E C B
D412
RED
GREEN
Rec. Solenoid
(SOL-3)

NOTES

- CNP5 : From LOGIC PWB
- CNP6 : From MECHANISM
- CNP7 : From POWER SUPPLY PWB
- CNP8 : From MAIN PWB

(MECHANISM CONTROL)

Figure 21 WIRING SIDE OF P.W. BOARD (MECHANISM CONTROL)


CNP3
7 6 5 4 3 2 1
CNP1
2 1
CNP-TRI
1 2 3 4 5
Q506
E C B
R511
C523
R513
ZD504
C538
C524
C525
D509
D513
18-1
D510
R507
VR501
Q504
E C B
TH501
R508
TP13
R502
C517
R503
R505
H
E
R504
F
J
C510
D512
F504
F505
F502
F503
C508
C506
C509
C526
C527
D506
D505
D507
D508
D502
D501
D503
D504
R509
C518
C516
C515
G
ZD502
C513
C514
D
ZD505
C512
C511
R510
C519
C501
B
R501
C
K
M
L
C521
R523
ZD503
C520
C522
C502
ZD501
C503
A
R516
R515
R514
C505
C504
7-3
7-5
7-7
7-9
7-1
18-3
51-1
11-1
11-2
18-4
BLUE
39
BROWN
35
GREEN
37
ORANGE
40
YELLOW
38
RED
36
CNS7
To MECHANISM CONTROL PWB (CNP7)
1 2 3 4 5 6 7 8 9
BROWN
RED
ORANGE
YELLOW
GREEN
BROWN
BLACK
RED
WHITE
RED
VIOLET
BLUE
BLACK
YELLOW
ORANGE
RED
BROWN
M L K J H G F E D C B A
Q505
B C E
F0904AFA2
Q503
B C E
H13A 94V-1
Q502
B C E
B
SHARP
Q501
B C E
SHARP H13A 94V-1
F0904AFA1 : B

NOTES

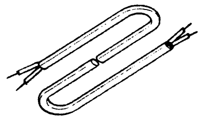
- CNP-TRI : From POWER TRANSFORMER (CNS-TRI)
- CNP1 : From TIMER SOCKET (CNS1)

- CNP3 : From LOGIC PWB (CNS3)

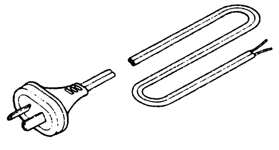
Figure 23 WIRING SIDE OF P.W. BOARD (POWER SUPPLY)

Mains supply cord
QACCV0001AGZZ
Bushing
LBSHC0004AGZZ

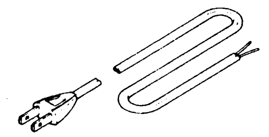
QACCB0052AF09
LBSHC0002AGZZ
Ⓐ : Brown
Ⓑ : Blue



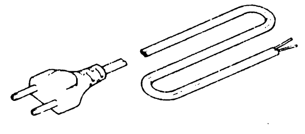
QACCL0001AFZZ
LBSHC0007AFZZ
Ⓐ : Brand stamp
Ⓑ : Projection Stripe



QACCZ0002TA0F
LBSHC0007AFZZ
Ⓐ : Brown
Ⓑ : Brown



QACCZ0053AF00
LBSHC0007AFZZ
Ⓐ : Black
Ⓑ : Black



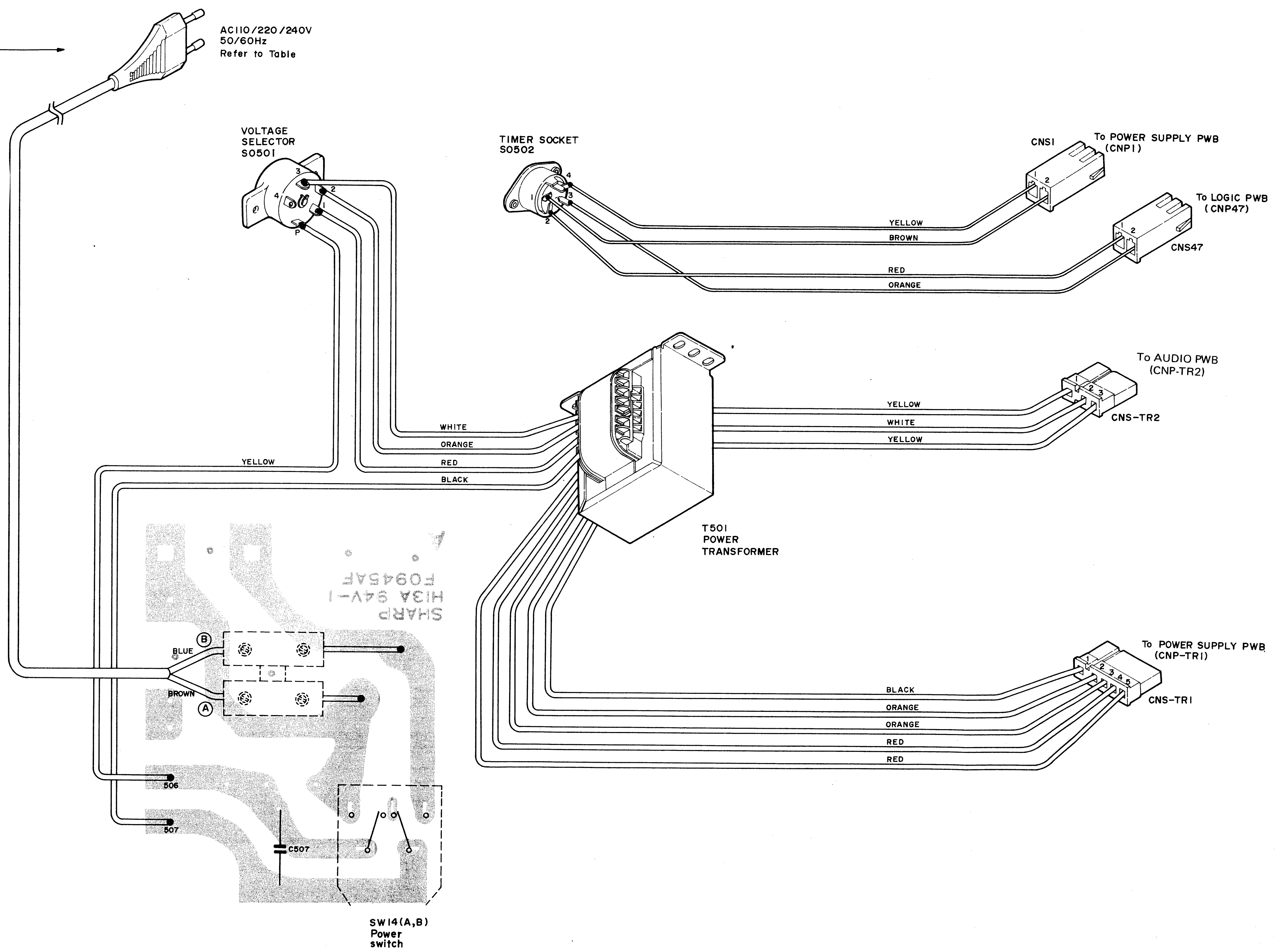
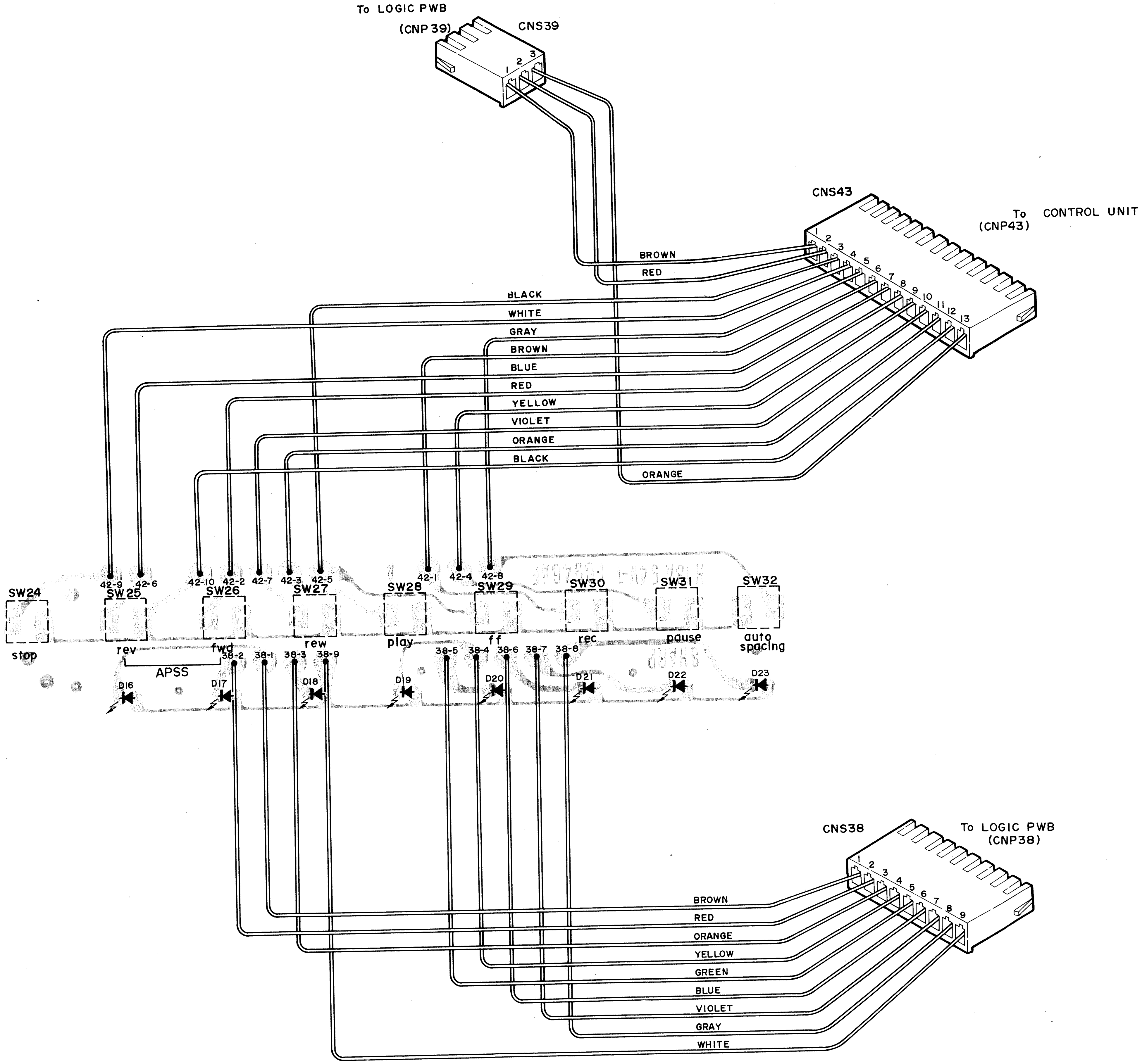

AC110/220/240V
50/60Hz
Refer to Table
VOLTAGE
SELECTOR
S0501
3
4
2
1
P
TIMER SOCKET
S0502
4
3
1
2
CNS1
To POWER SUPPLY PWB
(CNP1)
1
2
To LOGIC PWB
(CNP47)
1
2
CNS47
YELLOW
BROWN
RED
ORANGE
To AUDIO PWB
(CNP-TR2)
1
2
3
CNS-TR2
YELLOW
WHITE
YELLOW
WHITE
ORANGE
RED
BLACK
YELLOW
T501
POWER
TRANSFORMER
SHARP
HI3A 94V-1
F0945AF
BLUE
Ⓑ
BROWN
Ⓐ
506
507
C507
SW14(A,B)
Power
switch
To POWER SUPPLY PWB
(CNP-TR1)
1
2
3
4
5
CNS-TR1
BLACK
ORANGE
ORANGE
RED
RED

Figure 25 WIRING SIDE OF P.W. BOARD (AC POWER SUPPLY)


To LOGIC PWB
(CNP39)
CNS39
1
2
3
CNS43
To CONTROL UNIT
(CNP43)
1
2
3
4
5
6
7
8
9
10
11
12
13
BROWN
RED
BLACK
WHITE
GRAY
BROWN
BLUE
RED
YELLOW
VIOLET
ORANGE
BLACK
ORANGE
42-9
42-6
42-10
42-2
42-7
42-3
42-5
42-1
42-4
42-8
SW24
SW25
SW26
SW27
SW28
SW29
SW30
SW31
SW32
stop
rev
fwd
rew
play
ff
rec
pause
auto
spacing
APSS
38-2
38-1
38-3
38-9
38-5
38-4
38-6
38-7
38-8
D16
D17
D18
D19
D20
D21
D22
D23
CNS38
To LOGIC PWB
(CNP38)
1
2
3
4
5
6
7
8
9
BROWN
RED
ORANGE
YELLOW
GREEN
BLUE
VIOLET
GRAY
WHITE

(MECHANISM CONTROL

Figure 27 WIRING SIDE OF P.W. BOARD (MECHANISM CONTROL SWITCH)

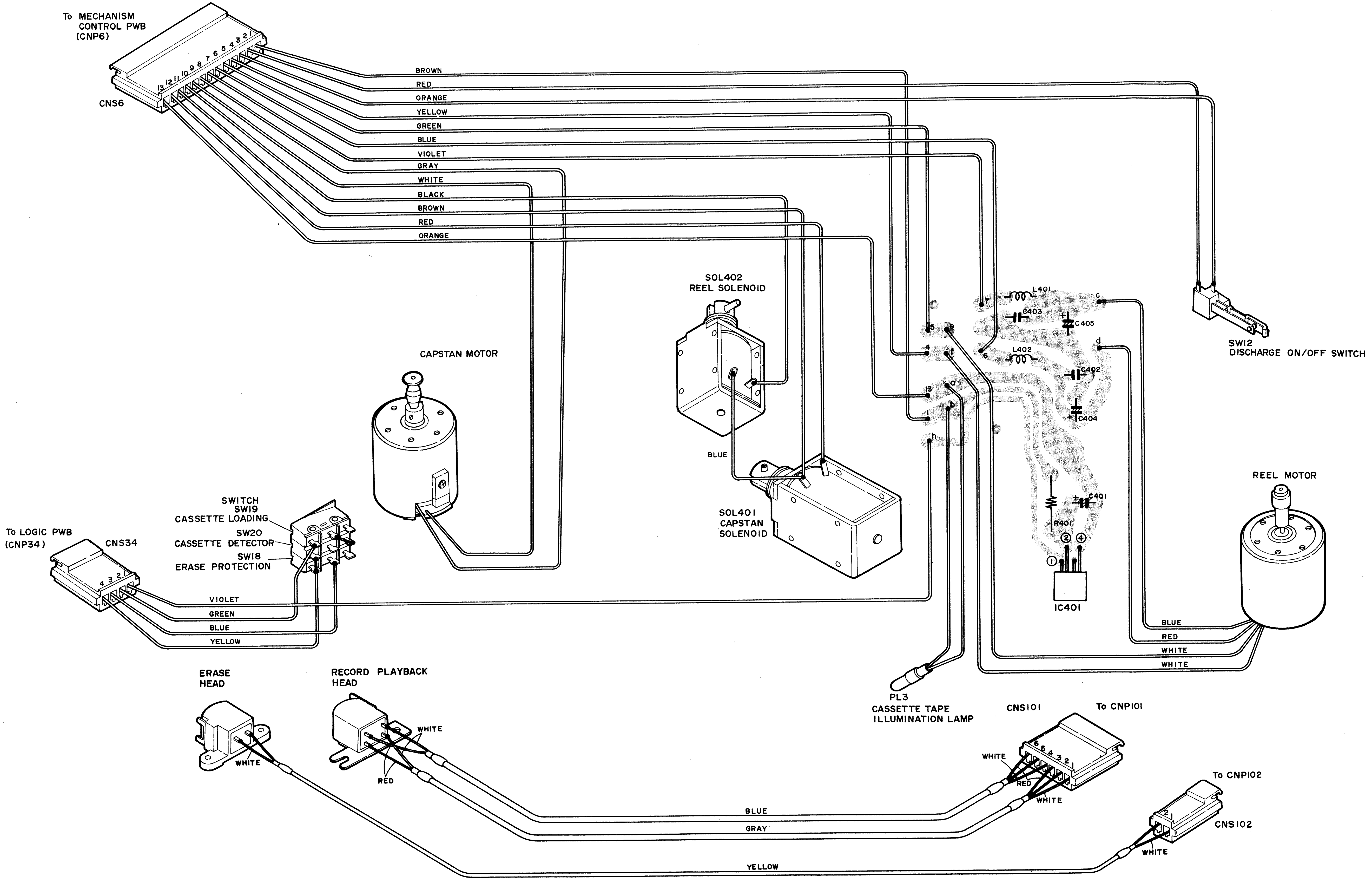

To MECHANISM
CONTROL PWB
(CNP6)
CNS6
13 12 11 10 9 8 7 6 5 4 3 2 1
BROWN
RED
ORANGE
YELLOW
GREEN
BLUE
VIOLET
GRAY
WHITE
BLACK
BROWN
RED
ORANGE
SOL402
REEL SOLENOID
CAPSTAN MOTOR
BLUE
SOL401
CAPSTAN
SOLENOID
L401
C403
C405
L402
C402
C404
C401
R401
IC401
① ② ④
5 e 4 f 13 a 1 b h 7 6 c d
SW12
DISCHARGE ON/OFF SWITCH
REEL MOTOR
BLUE
RED
WHITE
WHITE
To LOGIC PWB
(CNP34)
CNS34
4 3 2 1
SWITCH
SW19
CASSETTE LOADING
SW20
CASSETTE DETECTOR
SW18
ERASE PROTECTION
VIOLET
GREEN
BLUE
YELLOW
PL3
CASSETTE TAPE
ILLUMINATION LAMP
ERASE
HEAD
WHITE
RECORD PLAYBACK
HEAD
WHITE
RED
CNS101
To CNP101
6 5 4 3 2 1
WHITE
RED
WHITE
BLUE
GRAY
YELLOW
To CNP102
2 1
CNS102
WHITE

Figure 29 WIRING SIDE OF P.W. BOARD (MECHANISM)

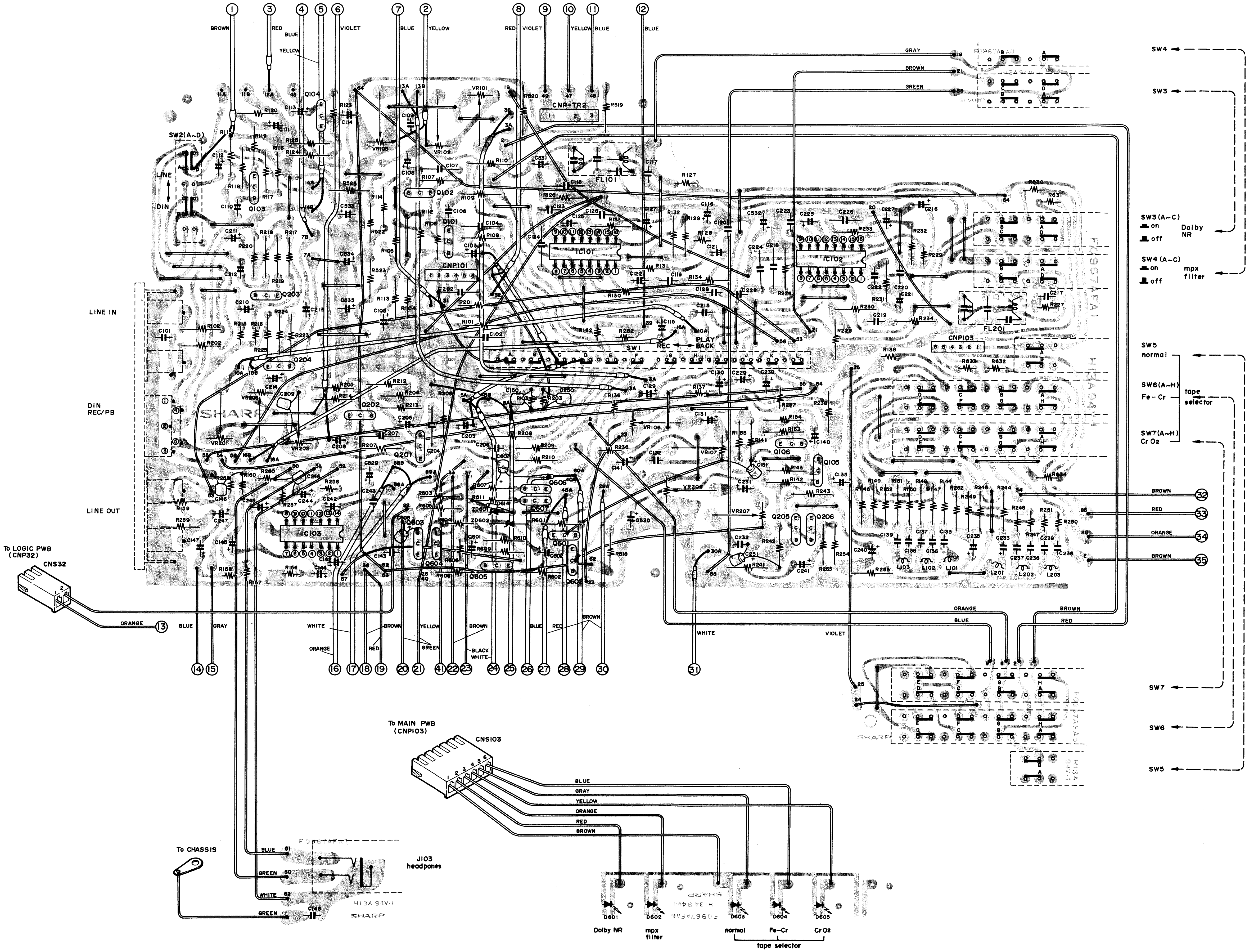

BROWN
RED
BLUE
YELLOW
VIOLET
GRAY
GREEN
ORANGE
WHITE
BLACK WHITE
SW2(A~D)
LINE
DIN
LINE IN
DIN REC/PB
LINE OUT
To LOGIC PWB (CNP32)
CNS32
SHARP
IC101
IC102
IC103
CNP101
CNP103
CNP-TR2
FL101
FL201
SW1
REC
PLAY BACK
SW4
SW3
SW3 (A~C)
on
off
Dolby NR
SW4 (A~C)
mpx filter
SW5
normal
SW6 (A~H)
Fe-Cr
tape selector
SW7 (A~H)
CrO2
SW7
SW6
SW5
To MAIN PWB (CNP103)
CNS103
To CHASSIS
J103 headpones
D601
D602
D603
D604
D605
Dolby NR
mpx filter
normal
Fe-Cr
CrO2
tape selector
①
②
③
④
⑤
⑥
⑦
⑧
⑨
⑩
⑪
⑫
⑬
⑭
⑮
⑯
⑰
⑱
⑲
⑳
㉑
㉒
㉓
㉔
㉕
㉖
㉗
㉘
㉙
㉚
㉛
㉜
㉝
㉞
㉟
㊶

Figure 31 WIRING SIDE OF P.W. BOARD (AUDIO SECTION 1/3)

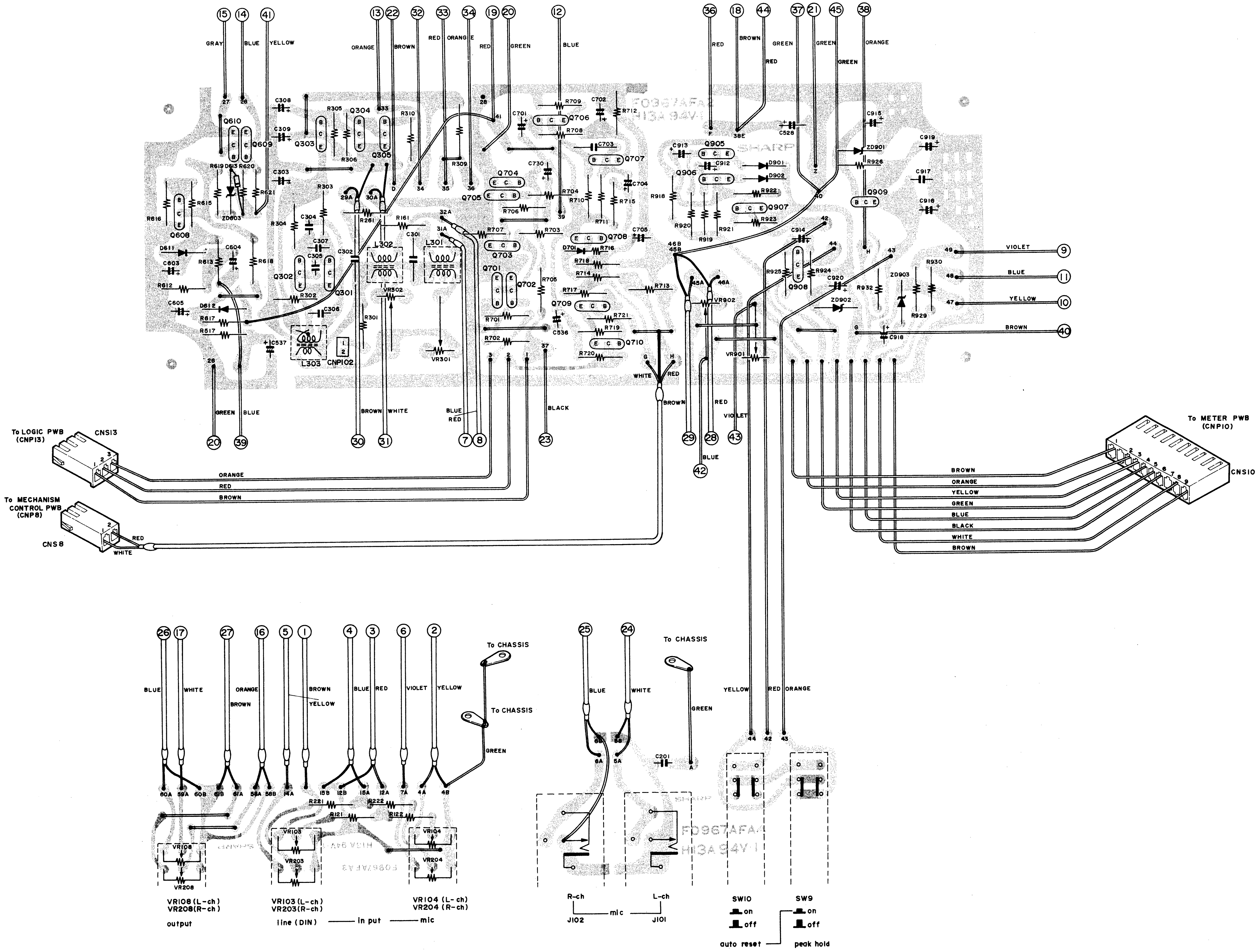

To LOGIC PWB (CNP13)
CNS13
To MECHANISM CONTROL PWB (CNP8)
CNS8
To METER PWB (CNP10)
CNS10
To CHASSIS
To CHASSIS
To CHASSIS
GRAY
BLUE
YELLOW
ORANGE
BROWN
RED
GREEN
VIOLET
WHITE
BLACK
F0967AFA
H13A 94V-1
SHARP
Q610
Q609
Q608
Q303
Q304
Q305
Q302
Q301
Q704
Q705
Q706
Q707
Q708
Q703
Q701
Q702
Q709
Q710
Q905
Q906
Q907
Q908
Q909
L301
L302
L303
CNP102
VR301
VR302
VR901
VR902
ZD901
ZD902
ZD903
ZD603
D611
D612
D613
D701
D901
D902
VR108 (L-ch)
VR208 (R-ch)
output
VR103 (L-ch)
VR203 (R-ch)
line (DIN)
in put
VR104 (L-ch)
VR204 (R-ch)
mic
R-ch
L-ch
J102
mic
J101
SW10
on
off
SW9
on
off
auto reset
peak hold

Figure 33 WIRING SIDE OF P.W. BOARD (AUDIO SECTION 2/3)

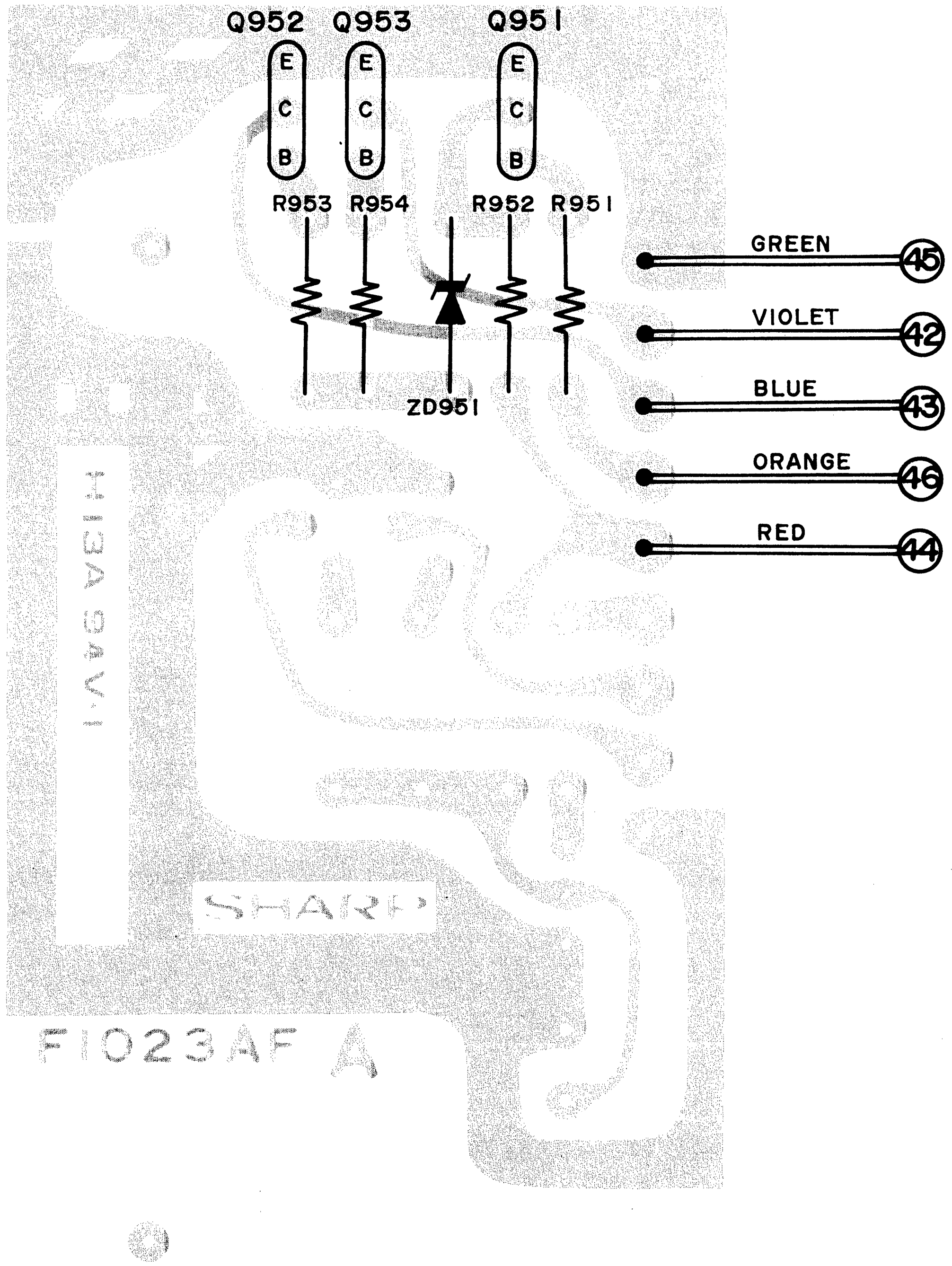
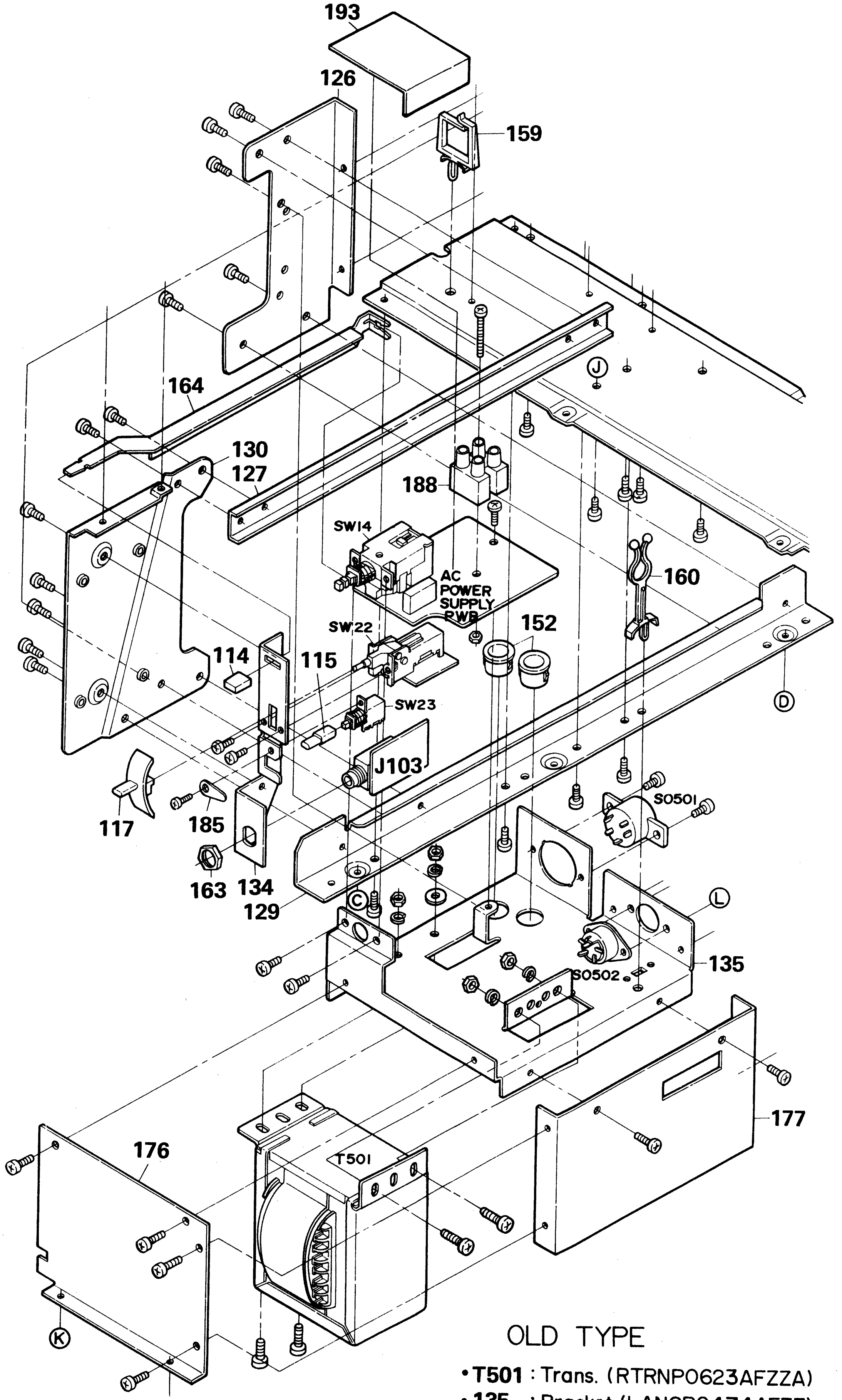

Q952
Q953
Q951
E
C
B
R953
R954
R952
R951
ZD951
GREEN
45
VIOLET
42
BLUE
43
ORANGE
46
RED
44
SHARP
F1023AF A

Figure 35 WIRING SIDE OF P.W. BOARD (AUDIO SECTION 3/3)


193
126
159
164
130
127
188
J
SW14
AC POWER SUPPLY PWB
160
SW22
152
114
115
SW23
D
J103
117
185
S0501
163
134
129
C
L
S0502
135
177
176
T501
K

OLD TYPE

- **T501** : Trans. (RTRNP0623AFZZA)
- **135** : Bracket (LANGR0474AFZZ)
- **193** : Cover (PCOVW7110AFZZ)

Figure 36 CABINET EXPLODED VIEW (OLD TYPE)

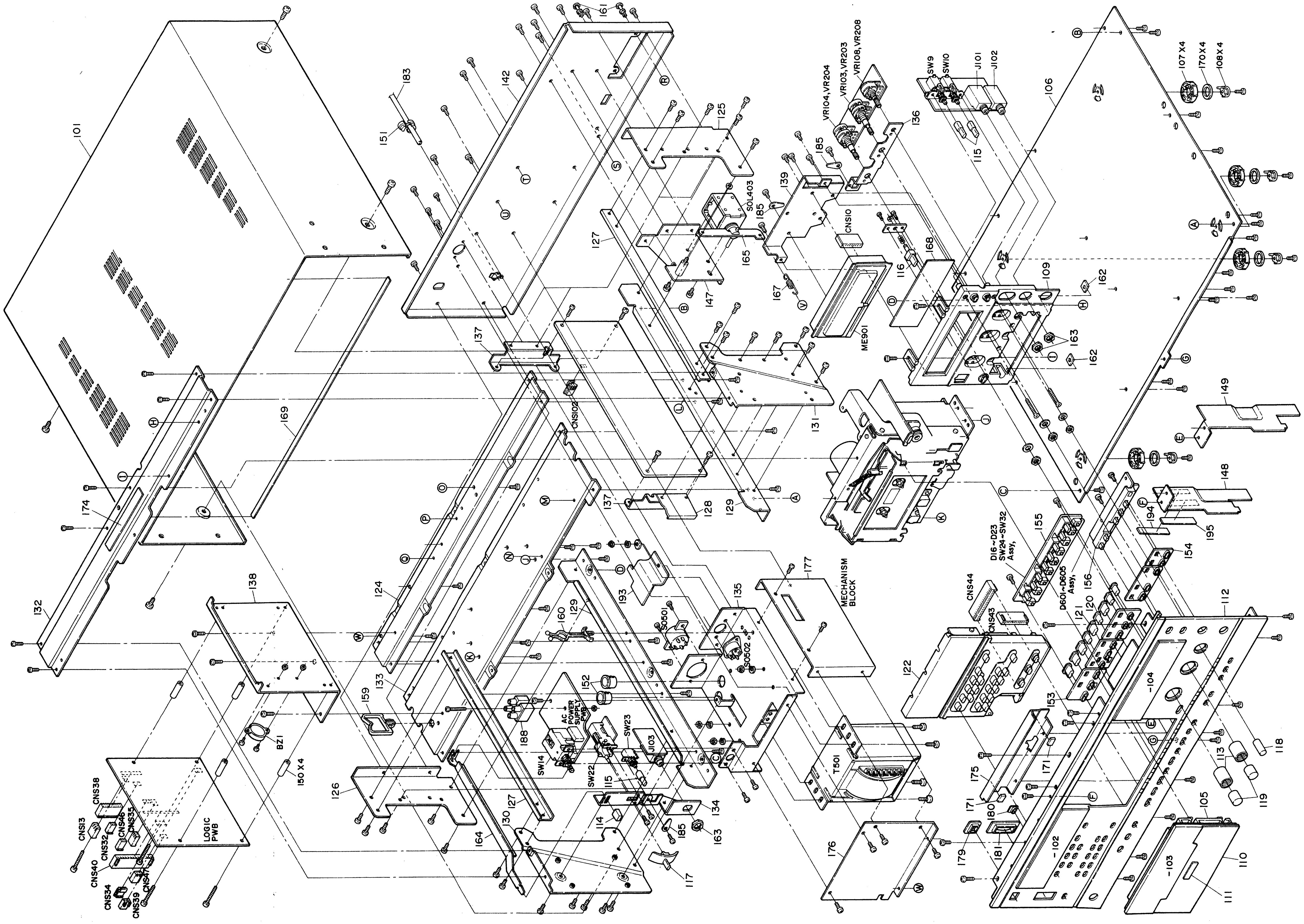

101
183
151
142
161
R
125
S
T
U
127
147
B
165
185
SOL403
139
185
CNS10
167
V
ME901
116
168
136
VR104,VR204
VR103,VR203
VR108,VR208
SW9
SW10
J101
J102
115
106
107 X4
170 X4
108 X4
B
A
109
162
D
H
163
I
162
G
149
E
131
L
J
137
CNS102
169
H
174
I
132
138
124
O
P
Q
M
N
137
128
129
A
C
K
148
F
194
195
155
D16~D23,
SW24~SW32
Assy,
154
156
D601~D605
Assy,
121
120
112
CNS44
CNS43
177
MECHANISM
BLOCK
135
S0501
S0502
193
D
160
129
W
K
133
159
126
188
AC
POWER
SUPPLY
PWB
152
SW14
SW22
SW23
J103
115
127
130
164
114
185
134
163
117
C
122
153
-104
E
G
113
118
119
105
110
-103
111
-102
181
179
180
171
175
F
171
T501
176
W
150 X4
BZ1
LOGIC
PWB
CNS38
CNS13
CNS32
CNS46
CNS35
CNS40
CNS34
CNS39
CNS47

Figure 37 CABINET EXPLODED VIEW (TAPE DECK 1/2)

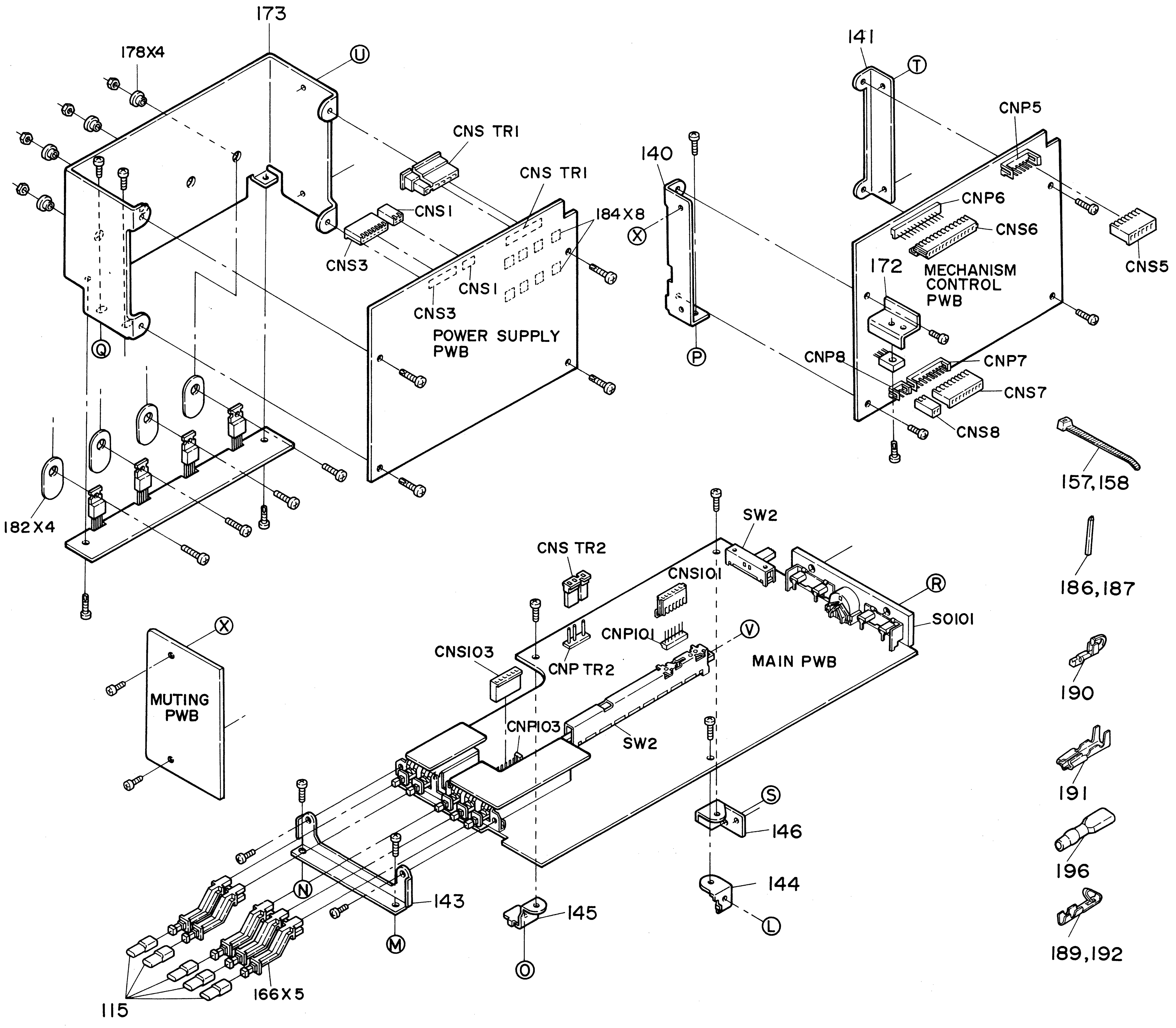

173
178X4
U
CNS TR1
CNS TR1
CNS1
CNS3
184X8
CNS1
CNS3
POWER SUPPLY PWB
Q
182X4
141
T
CNP5
140
X
CNP6
CNS6
CNS5
172
MECHANISM CONTROL PWB
P
CNP8
CNP7
CNS7
CNS8
157,158
186,187
SW2
CNS TR2
CNS101
R
S0101
CNP101
V
CNS103
CNP TR2
MAIN PWB
X
MUTING PWB
CNP103
SW2
S
146
144
L
143
N
M
145
O
115
166X5
190
191
196
189,192

Figure 39 CABINET EXPLODED VIEW (TAPE DECK 2/2)

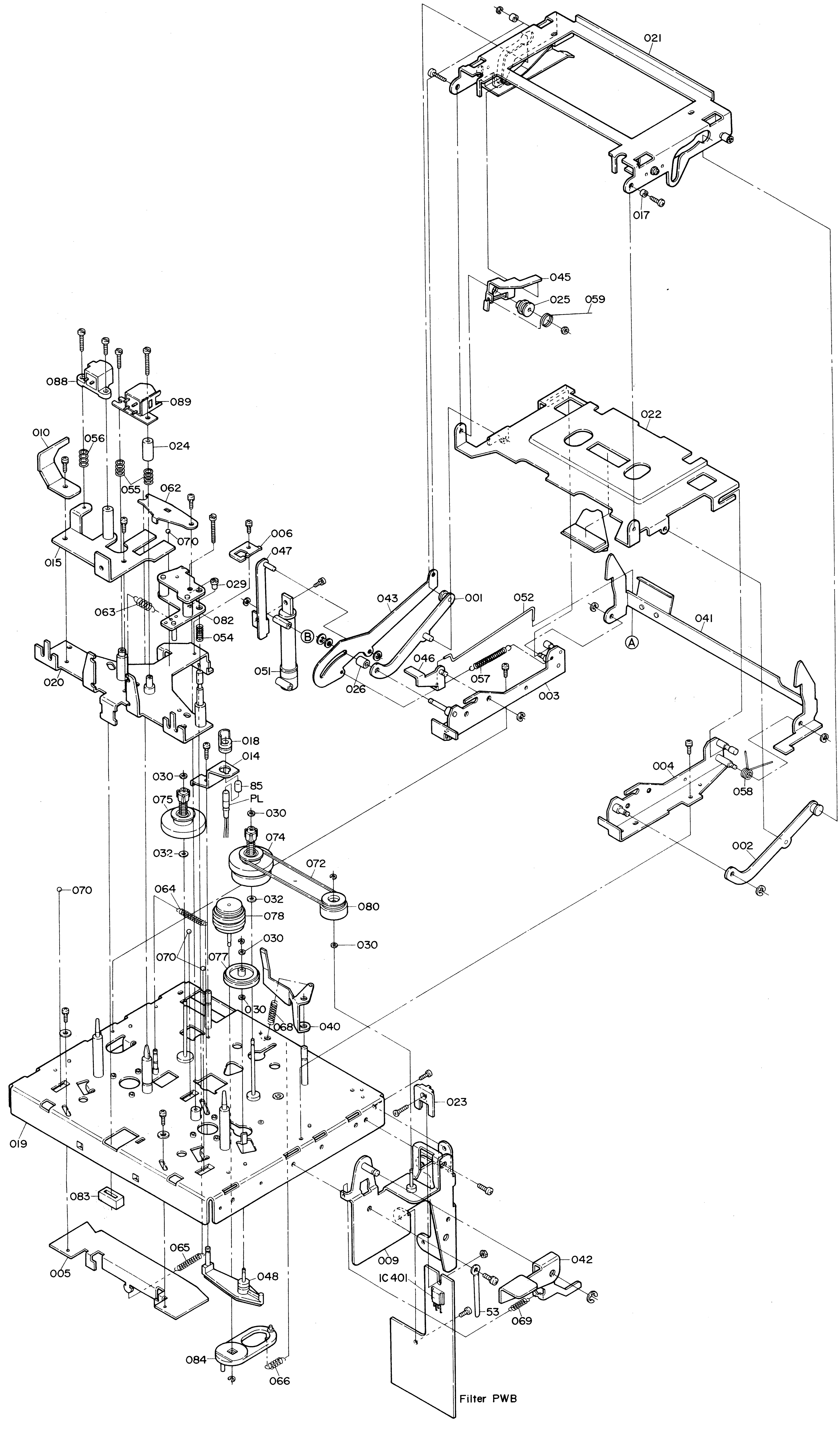

021
017
045
025
059
022
088
089
010
056
024
055
062
006
070
047
015
029
043
001
052
041
063
082
054
Ⓐ
Ⓑ
046
057
051
020
026
003
018
014
004
058
030
85
PL
075
030
074
072
002
032
064
070
032
078
080
030
070
077
030
068
040
019
023
083
065
009
042
005
048
IC 401
53
069
084
066
Filter PWB

Figure 41 MECHANISM EXPLODED TOP VIEW

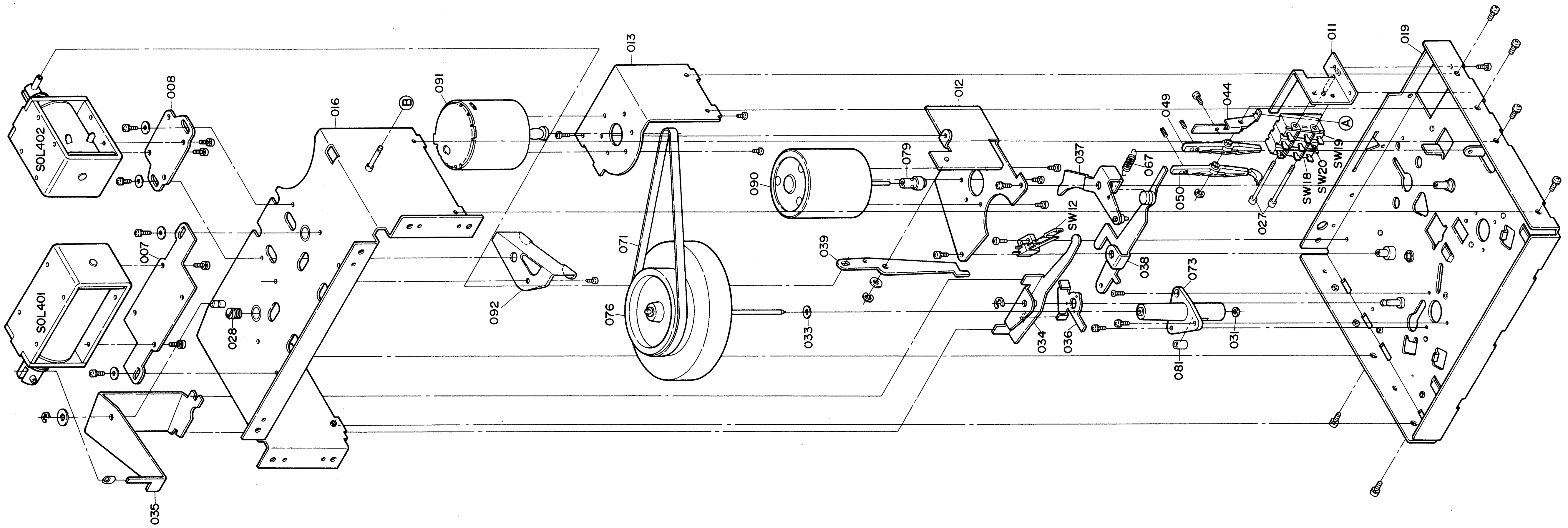

SOL402
008
016
B
091
013
012
011
019
044
049
A
037
067
079
090
SW19
SW20
SW18
050
027
SW12
039
038
073
071
092
076
033
034
036
031
081
028
007
SOL401
035

Figure 43 MECHANISM EXPLODED BOTTOM VIEW

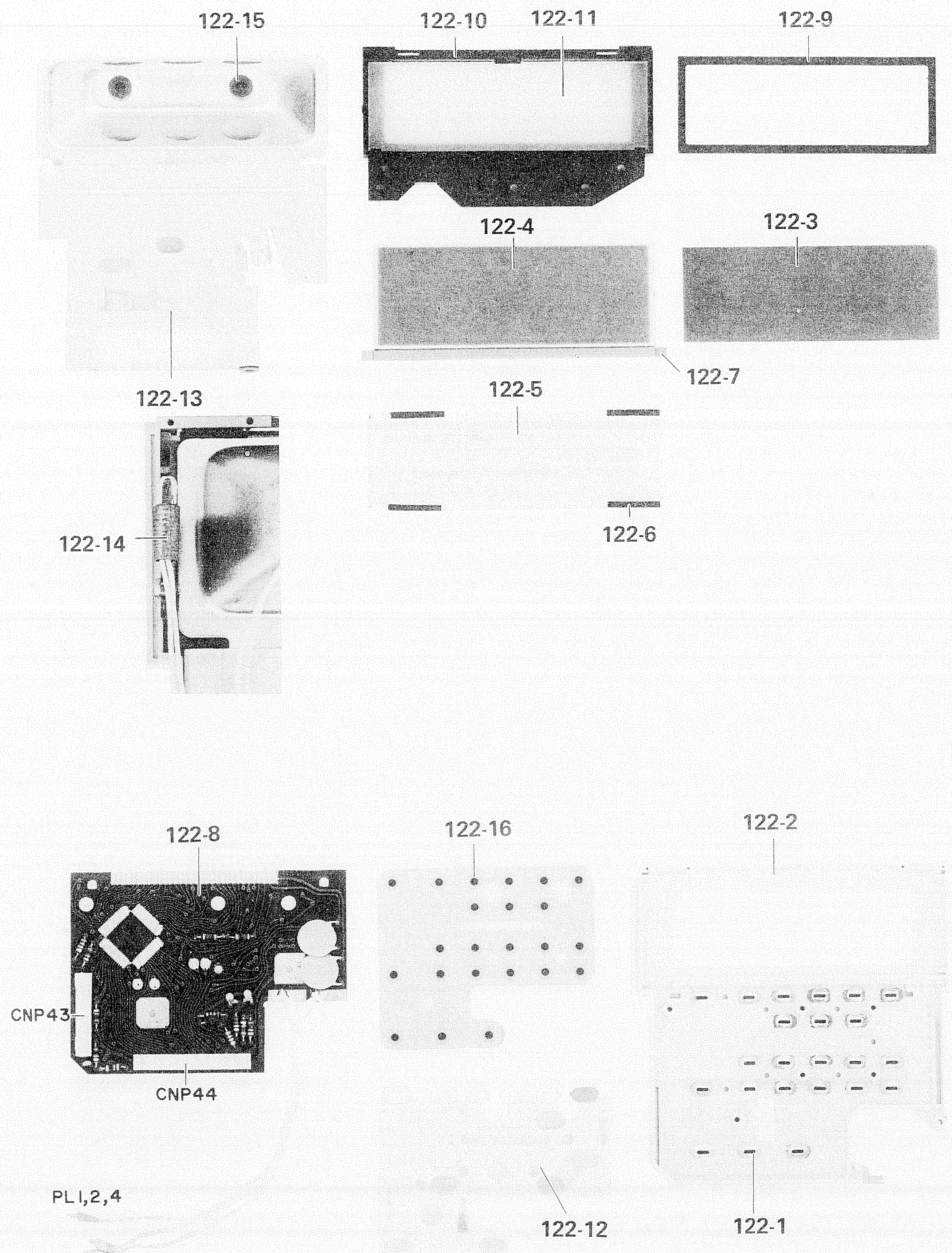


Figure 45 MICROPROCESSOR-CONTROLLED UNIT EXPLODED VIEW

REPLACEMENT PARTS LIST

"HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly, please furnish the following informations.

1. MODEL NUMBER
2. REF. NO.
3. PART NO.
4. DESCRIPTION

NOTES: Be sure to use regular parts for securing the safety and reliability of the set. Parts marked with " ⚠ " and parts cross-hatched (in black) are especially important for maintaining the safety and protecting ability of the set.
Be sure to replace them with parts of specified part number.

INTEGRATED CIRCUITS

REF. NO.	PART NO.	DESCRIPTION	CODE
IC1	RH-IX1154AFZZ	Inverter (TC4069UBP)	AE
IC2	RH-IX1161AFZZ	8 bit 2 Line Instruction Decorder (M54883P)	AY
IC101, IC102	VHINE646B//-1	Dolby N.R. (NE646B)	AR
IC103	VHILA4170//-1	Headphone Amp. (LA4170)	AK
IC401	RH-IX1075AFZZ	Hall Element (DN838)	AK

TRANSISTORS

REF. NO.	PART NO.	DESCRIPTION	CODE
Q1, Q2, Q3, Q4	VS2SC945AP/-1	3V to 5V level Interface (2SC945AP)	AB
Q5, Q6, Q7, Q8	VS2SC945AP/-1	To 3V Level Interface (2SC945AP)	AB
Q9	VS2SC945AP/-1	Auto Clear for IC2 (2SC945AP)	AB
Q10	VS2SC945AP/-1	Relay (RLY1) Switching (2SC945AP)	AB
Q11	VS2SC945AP/-1	Auto Clear for IC2 (2SC945AP)	AB
Q12	VS2SC945AP/-1	Timer Synchronous Operation (2SC945AP)	AB
Q13, Q14, Q15	VS2SC945AP/-1	Beep Tone Oscillator (2SC945AP)	AB
Q16	VS2SC945AP/-1	Playback Muting (2SC945AP)	AB
Q17	VS2SC945AP/-1	Time Counter Start/Stop (2SC945AP)	AB
Q18	VS2SC945AP/-1	Counter Pulse Generator (2SC945AP)	AB
Q19, Q20	VS2SA733-P/-1	Counter Pulse Generator (2SA733P)	AC
Q101, Q201	VS2SC2240BL-1	Playback/Equalizer Amp. (2SC2240BL)	AC
Q102, Q202	VS2SC2240BL-1	Playback/Equalizer Amp. (2SC2240BL)	AC
Q103, Q203	VS2SC732BTM-1	DIN Amp. (2SC732BTM)	AC
Q104, Q204	VS2SC732BTM-1	Muting Amp. (2SC732BTM)	AC
Q105, Q205	VS2SC1815GR-1	Record Equalizer Amp. (2SC1815GR)	AB
Q106, Q206	VS2SA1015-Y-1	Record Equalizer Amp. (2SA1015Y)	AC
Q301, Q302	VS2SC1627Y/-1	Bias Oscillator (2SC1627Y)	AD
Q303	VS2SC1627Y/-1	Switching, Bias (2SC1627Y)	AD
Q304	VS2SC1815GR-1	Switching, Bias (2SC1815GR)	AB
Q305	VS2SC1815GR-1	Switching, Bias (2SC1815GR)	AB
Q401	VS2SC945AP/-1	Switching (2SC945AP)	AB
Q402	VS2SA733-P/-1	Switching (2SA733P)	AC
Q403	VS2SC945AP/-1	Switching (2SC945AP)	AB
Q404	VS2SB744-Q/-1	Reel Solenoid Driver (2SB744Q)	AE
Q405	VS2SC945AP/-1	Switching (2SC945AP)	AB
Q406	VS2SB744-Q/-1	Reel Solenoid Driver (2SB744Q)	AE
Q407	VS2SC945AP/-1	Switching (2SC945AP)	AB
Q408	VS2SA733-P/-1	Switching (2SA733P)	AC
Q409	VS2SC945AP/-1	Switching (2SA945AP)	AB
Q410	VS2SB744-Q/-1	Capstan Solenoid Driver (2SB744Q)	AE
Q411	VS2SC945AP/-1	Switching (2SC945AP)	AB
Q412	VS2SB744-Q/-1	Capstan Solenoid Driver (2SB744Q)	AE
Q413	VS2SC945AP/-1	Switching (2SC945AP)	AB
Q414	VS2SA733-P/-1	Switching (2SA733P)	AC
Q415	VS2SC945AP/-1	Switching (2SC945AP)	AB
Q416	VS2SB744-Q/-1	Record Solenoid Driver (2SB744Q)	AE
Q417	VS2SC945AP/-1	Switching (2SC945AP)	AB
Q418	VS2SB744-Q/-1	Record Solenoid Driver (2SB744Q)	AE
Q419	VS2SA733-Q/-1	Reel Motor Governor (2SA733Q)	AC
Q420	VS2SC945AQ/-1	Reel Motor Governor (2SC945AQ)	AB
Q421	VS2SA733-Q/-1	Reel Motor Governor (2SA733Q)	AC
Q422	VS2SC945AQ/-1	Reel Motor Governor (2SC945AQ)	AB
Q423	VS2SA733-Q/-1	Reel Motor Governor (2SA733Q)	AC
Q424	VS2SB744-Q/-1	Reel Motor Governor (2SB744Q)	AE
Q425	VS2SC945AQ/-1	Reel Motor Control (2SC945AQ)	AB
Q426	VS2SB562-C/-1	Reel Motor Switch (2SB562C)	AD
Q427	VS2SD468-C/-1	Reel Motor Switch (2SD468C)	AD
Q428	VS2SB562-C/-1	Reel Motor Switch (2SB562C)	AD
Q429	VS2SD468-C/-1	Reel Motor Switch (2SD468C)	AD
Q430	VS2SC945AQ/-1	Reel Motor Control (2SC945AQ)	AB
Q431	VS2SC945AP/-1	Switching (2SC945AP)	AB
Q432	VS2SB562-C/-1	Switching (2SB562C)	AD
Q501	VS2SD880-Y/-1	Constant Voltage Circuit, Amplifier (2SD880Y)	AF
Q502	VS2SD880-Y/-1	Constant Voltage Circuit, Motor (2SD880Y)	AF
Q503	VS2SD880-Y/-1	Constant Voltage Circuit, Logic (2SD880Y)	AF
Q504	VS2SC945AP/-1	Temperature Compesation, LSI (2SC945AP)	AB
Q505	VS2SD880-Y-1	Constant Voltage Circuit, Solenoid & Amplifier (2SD880Y)	AF

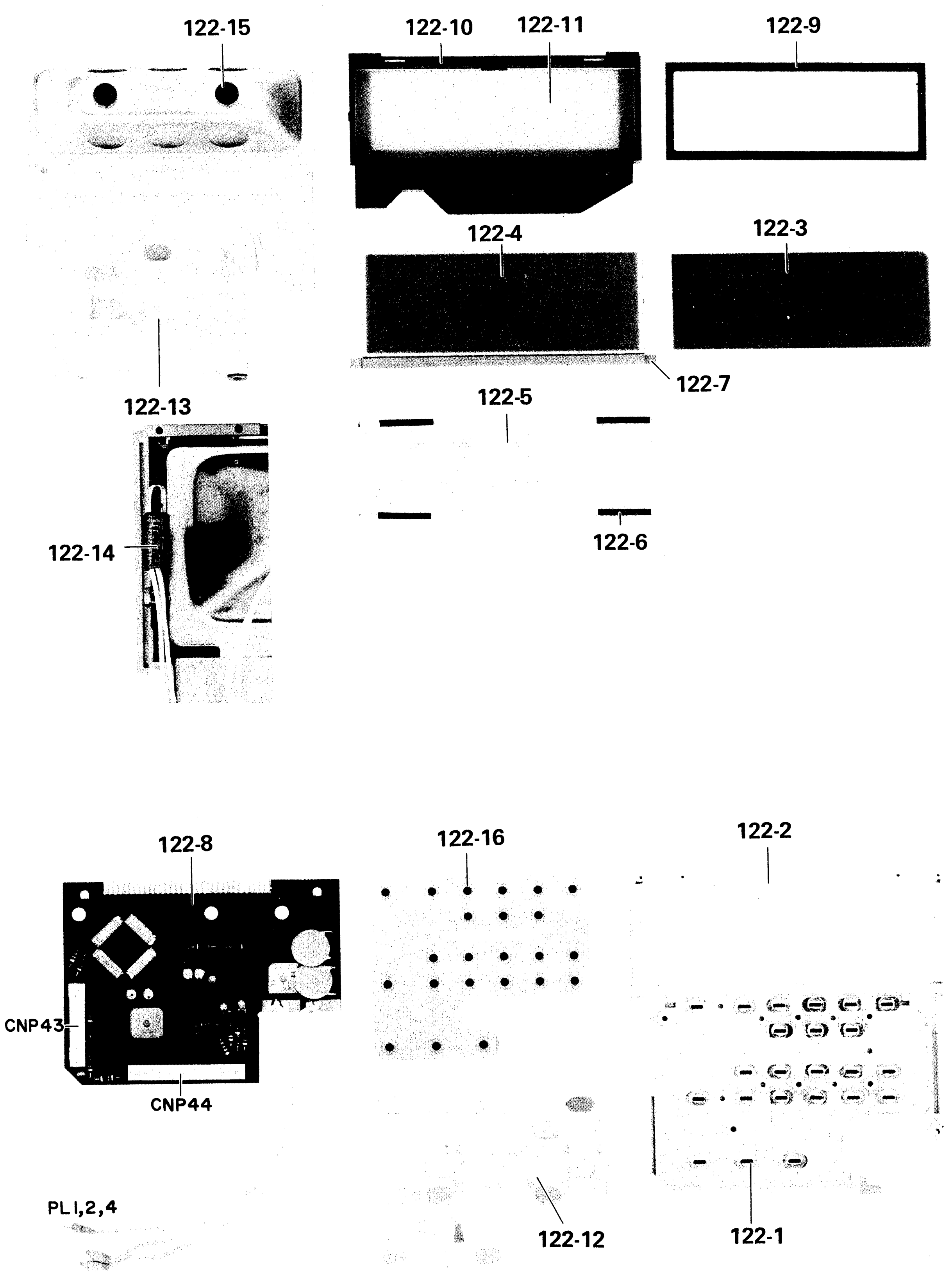


Figure 45 MICROPROCESSOR-CONTROLLED UNIT EXPLODED VIEW

REPLACEMENT PARTS LIST

"HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly, please furnish the following informations.

1. MODEL NUMBER
2. REF. NO.
3. PART NO.
4. DESCRIPTION

NOTES: Be sure to use regular parts for securing the safety and reliability of the set. Parts marked with " ⚠ " and parts cross-hatched (in black) are especially important for maintaining the safety and protecting ability of the set. Be sure to replace them with parts of specified part number.

INTEGRATED CIRCUITS

REF. NO.	PART NO.	DESCRIPTION	CODE
IC1	RH-IX1154AFZZ	Inverter (TC4069UBP)	AE
IC2	RH-IX1161AFZZ	8 bit 2 Line Instruction Decorder (M54883P)	AY
IC101, IC102	VHINE646B//-1	Dolby N.R. (NE646B)	AR
IC103	VHILA4170//-1	Headphone Amp. (LA4170)	AK
IC401	RH-IX1075AFZZ	Hall Element (DN838)	AK

TRANSISTORS

REF. NO.	PART NO.	DESCRIPTION	CODE
Q1, Q2, Q3, Q4	VS2SC945AP/-1	3V to 5V level Interface (2SC945AP)	AB
Q5, Q6, Q7, Q8	VS2SC945AP/-1	To 3V Level Interface (2SC945AP)	AB
Q9	VS2SC945AP/-1	Auto Clear for IC2 (2SC945AP)	AB
Q10	VS2SC945AP/-1	Relay (RLY1) Switching (2SC945AP)	AB
Q11	VS2SC945AP/-1	Auto Clear for IC2 (2SC945AP)	AB
Q12	VS2SC945AP/-1	Timer Synchronous Operation (2SC945AP)	AB
Q13, Q14, Q15	VS2SC945AP/-1	Beep Tone Oscillator (2SC945AP)	AB
Q16	VS2SC945AP/-1	Playback Muting (2SC945AP)	AB
Q17	VS2SC945AP/-1	Time Counter Start/Stop (2SC945AP)	AB
Q18	VS2SC945AP/-1	Counter Pulse Generator (2SC945AP)	AB
Q19, Q20	VS2SA733-P/-1	Counter Pulse Generator (2SA733P)	AC
Q101, Q201	VS2SC2240BL-1	Playback/Equalizer Amp. (2SC2240BL)	AC
Q102, Q202	VS2SC2240BL-1	Playback/Equalizer Amp. (2SC2240BL)	AC
Q103, Q203	VS2SC732BTM-1	DIN Amp. (2SC732BTM)	AC
Q104, Q204	VS2SC732BTM-1	Muting Amp. (2SC732BTM)	AC
Q105, Q205	VS2SC1815GR-1	Record Equalizer Amp. (2SC1815GR)	AB
Q106, Q206	VS2SA1015-Y-1	Record Equalizer Amp. (2SA1015Y)	AC
Q301, Q302	VS2SC1627Y/-1	Bias Oscillator (2SC1627Y)	AD
Q303	VS2SC1627Y/-1	Switching, Bias (2SC1627Y)	AD
Q304	VS2SC1815GR-1	Switching, Bias (2SC1815GR)	AB
Q305	VS2SC1815GR-1	Switching, Bias (2SC1815GR)	AB
Q401	VS2SC945AP/-1	Switching (2SC945AP)	AB
Q402	VS2SA733-P/-1	Switching (2SA733P)	AC
Q403	VS2SC945AP/-1	Switching (2SC945AP)	AB
Q404	VS2SB744-Q/-1	Reel Solenoid Driver (2SB744Q)	AE
Q405	VS2SC945AP/-1	Switching (2SC945AP)	AB
Q406	VS2SB744-Q/-1	Reel Solenoid Driver (2SB744Q)	AE
Q407	VS2SC945AP/-1	Switching (2SC945AP)	AB
Q408	VS2SA733-P/-1	Switching (2SA733P)	AC
Q409	VS2SC945AP/-1	Switching (2SA945AP)	AB
Q410	VS2SB744-Q/-1	Capstan Solenoid Driver (2SB744Q)	AE
Q411	VS2SC945AP/-1	Switching (2SC945AP)	AB
Q412	VS2SB744-Q/-1	Capstan Solenoid Driver (2SB744Q)	AE
Q413	VS2SC945AP/-1	Switching (2SC945AP)	AB
Q414	VS2SA733-P/-1	Switching (2SA733P)	AC
Q415	VS2SC945AP/-1	Switching (2SC945AP)	AB
Q416	VS2SB744-Q/-1	Record Solenoid Driver (2SB744Q)	AE
Q417	VS2SC945AP/-1	Switching (2SC945AP)	AB
Q418	VS2SB744-Q/-1	Record Solenoid Driver (2SB744Q)	AE
Q419	VS2SA733-Q/-1	Reel Motor Governor (2SA733Q)	AC
Q420	VS2SC945AQ/-1	Reel Motor Governor (2SC945AQ)	AB
Q421	VS2SA733-Q/-1	Reel Motor Governor (2SA733Q)	AC
Q422	VS2SC945AQ/-1	Reel Motor Governor (2SC945AQ)	AB
Q423	VS2SA733-Q/-1	Reel Motor Governor (2SA733Q)	AC
Q424	VS2SB744-Q/-1	Reel Motor Governor (2SB744Q)	AE
Q425	VS2SC945AQ/-1	Reel Motor Control (2SC945AQ)	AB
Q426	VS2SB562-C/-1	Reel Motor Switch (2SB562C)	AD
Q427	VS2SD468-C/-1	Reel Motor Switch (2SD468C)	AD
Q428	VS2SB562-C/-1	Reel Motor Switch (2SB562C)	AD
Q429	VS2SD468-C/-1	Reel Motor Switch (2SD468C)	AD
Q430	VS2SC945AQ/-1	Reel Motor Control (2SC945AQ)	AB
Q431	VS2SC945AP/-1	Switching (2SC945AP)	AB
Q432	VS2SB562-C/-1	Switching (2SB562C)	AD
Q501	VS2SD880-Y/-1	Constant Voltage Circuit, Amplifier (2SD880Y)	AF
Q502	VS2SD880-Y/-1	Constant Voltage Circuit, Motor (2SD880Y)	AF
Q503	VS2SD880-Y/-1	Constant Voltage Circuit, Logic (2SD880Y)	AF
Q504	VS2SC945AP/-1	Temperature Compesation, LSI (2SC945AP)	AB
Q505	VS2SD880-Y-1	Constant Voltage Circuit, Solenoid & Amplifier (2SD880Y)	AF

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	CODE
Q506	VS2SC945AP/-1	Constant Voltage Circuit, Back up (2SC945AP)	AB
Q601, Q602	VS2SC1815GR-1	Record Muting Amp. (2SC1815GR)	AB
Q603	VS2SC1815GR-1	Line Muting Amp. (2SC1815GR)	AB
Q604	VS2SC1815GR-1	Line Muting Amp. (2SC1815GR)	AB
Q605	VS2SC1815GR-1	Record Muting Amp. (2SC1815GR)	AB
Q606, Q607	VS2SC1815GR-1	Line Muting Amp. (2SC1815GR)	AB
Q608	VS2SC1815GR-1	Muting (2SC1815GR)	AB
Q609, Q610	VS2SC1815GR-1	Line Muting Amp. (2SC1815GR)	AB
Q701	VS2SC1815GR-1	Muting (2SC1815GR)	AB
Q702	VS2SC1815GR-1	Muting (2SC1815GR)	AB
Q703	VS2SC1815GR-1	Muting (2SC1815GR)	AB
Q704, Q705	VS2SC1815GR-1	Gain Selector (2SC1815GR)	AB
Q706, Q707	VS2SC1815GR-1	APSS Amp. (2SC1815GR)	AB
Q708	VS2SA1015-Y-1	Rectifier (2SA1015Y)	AC
Q709, Q710	VS2SC1815GR-1	Detector (2SC1815GR)	AB
Q905, Q906, Q907, Q908	VS2SC1815GR-1	Auto Reset Circuit (2SC1815GR)	AB
Q909	VS2SB524-E/-1	Constant Voltage Circuit, Meter (2SB524E)	AF
Q951, Q952, Q953	VS2SC1815GR-1	Muting, Meter (2SC1815GR)	AB

DIODES

REF. NO.	PART NO.	DESCRIPTION	CODE
D1	VHD1S1555V/1G	Play Indicator Switching (at Auto Spacing Mode) (1S1555)	AB
D2	VHD1S1555V/1G	Play Muting (1S1555)	AB
D3, D4	VHD1S1555V/1G	Time Counter Control (1S1555)	AB
D5, D6	VHD1S1555V/1G	Protector, Reverse Current (1S1555)	AB
D8	VHD1S1555V/1G	ACL Pulse Generator (1S1555)	AB
D9	VHD1S1555V/1G	Surge Absorber (1S1555)	AB
D10, D11	VHD1S1555V/1G	Protector, Reverse Current (1S1555)	AB
D13	VHD1S1555V/1G	Discharge (1S1555)	AB
D14	VHD1S1555V/1G	Protector, Inverse Voltage (1S1555)	AB
D15	VHD1S1555V/1G	Protector, Reverse Current (1S1555)	AB
D16	VHPGL-9NG12-1	LED, Reverse-APSS Indicator (GL-9NG12)	AD
D17	VHPGL-9NG12-1	LED, Forward-APSS Indicator (GL-9NG12)	AD
D18	VHPGL-9NG12-1	LED, Rewind Indicator (GL-9NG12)	AD
D19	VHPGL-9NG12-1	LED, Play Indicator (GL-9NG12)	AD
D20	VHPGL-9NG12-1	LED, Fast-forward Indicator (GL-9NG12)	AD
D21	RH-PX1008AFZZ	LED, Record Indicator (GL-9PR2)	AD
D22	VHPGL-9NG12-1	LED, Pause Indicator (GL-9NG12)	AD
D23	VHPGL-9NG12-1	LED, Auto Spacing Indicator (GL-9NG12)	AD
D24	VHD1S1555V/1G	Auto Clear for IC2 (1S1555)	AB
D401, D402	VHD1S2076//-1	Rectifier (1S2076)	AB
D403	VHD10E1////-1	Protector, Reverse Current (10E1)	AC
D404	VHD10E1////-1	Surge Absorber (10E1)	AC
D405, D406	VHD1S2076//-1	Rectifier (1S2076)	AB
D407	VHD10E1////-1	Protector, Reverse Current (10E1)	AC
D408	VHD10E1////-1	Surge Absorber (10E1)	AC
D409, D410	VHD1S1555/1G	Rectifier (1S1555)	AB
D411	VHD10E1////-1	Protector, Reverse Current (10E1)	AC
D412	RH-IX1006AFZZ	Surge Absorber (10E1)	AC
D413	RH-DX1013AFZZ	Temperature Compensation (1N60-15)	AB
D414, D415	VHD1S2076//-1	Protector, Transistor (1S2076)	AB
D416, D417	VHD10E1////-1	Surge Absorber (10E1)	AC
D418, D419	VHD10E1////-1	Surge Absorber (10E1)	AC
⚠D501, ⚠D502, ⚠D503, ⚠D504	RH-DX1006AFZZ	Rectifier (10E1)	AB
⚠D505, ⚠D506, ⚠D507, ⚠D508	VHD30D1FAS/-1	Rectifier (30D1)	AD
⚠D509	RH-DX1006AFZZ	Rectifier (10E1)	AB
D510	RH-DX1006AFZZ	Rectifier (10E1)	AB
D512	VHD30D1FAS/-1	Rectifier (30D1)	AD
D513	RH-DX1006AFZZ	Rectifier (10E1)	AB
D601	VHPGL-9NG12-1	L.E.D., Dolby N.R. Indicator (GL-9NG12)	AD
D602	VHPGL-9NG12-1	L.E.D., FM. Multiplex Filter Indicator (GL-9NG12)	AD
D603	VHPGL-9NG12-1	LED, Tape Selector "normal" Indicator (GL-9NG12)	AD
D604	VHPGL-9NG12-1	LED, Tape Selector "Fe-Cr" Indicator (GL-9NG12)	AD
D605	VHPGL-9NG12-1	LED, Tape Selector "CrO2" Indicator (GL-9NG12)	AD
D611	VHD1S2076//-1	Capacitor Discharge (1S2076)	AB
D612	VHD1S2076//-1	Capacitor Charge (1S2076)	AB
D613	VHD1S2076//-1	Prevent, Reverse Current (1S2076)	AB
D614	VHD1S2076//-1	Prevent, Reverse Current (1S2076)	AB
D701	VHD1S2076//-1	Prevent, Reverse Current (1S2076)	AB
D901, D902	VHD1S2076//-1	Protector, Reverse Current (1S2076)	AB
ZD1	VHERD5R6EB2-1	Zener (5.6V 400mW), Voltage Stabilization for Relay (RLY1) (RD5.6EB2)	AB
ZD401	VHEMZ6R2///-1	Zener (6.2V), Reel Motor Governor (MZ6.2)	AE

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	CODE
ZD501	VHEXZ-205//-1	Zener (20.5V 500mW), Voltage Stabilization for Meter & Amplifier (XZ-205)	AB
ZD502	VHERD6R2EB3-1	Zener (6.2V 400mW), Voltage Stabilization for LED & Logic Circuit (RD6.2EB3)	AB
ZD503	VHEXZ-127//-1	Zener (12.7V 500mW), Voltage Stabilization for LCD Illumination Lamp & Capstan Reel Solenoid (XZ-127)	AB
ZD504	VHERD6R2EB3-1	Zener (6.2V 400mW), Voltage Stabilization for Logic Circuit (RD6.2EB3)	AB
ZD505	VHEXZ-127//-1	Zener (12.7V 500mW), Voltage Stabilization for Relay (RLY801-803) & Cassette Illumination Lamp (XZ-127)	AB
ZD601	VHE02Z6R8A/-1	Zener (6.8V, 250mW), Line Muting (02Z6R8A)	AB
ZD602	VHE02Z6R8A/-1	Zener (6.8V, 250mW), Muting (02Z6R8A)	AB
ZD603	VHE02Z6R8A/-1	Zener (6.8V, 250mW), Muting (02Z6R8A)	AB
ZD901	VHEXZ-185//-1	Zener (18.5V 500mW), Voltage Stabilization for Meter (XZ-185)	AB
ZD902	VHEXZ-137//-1	Zener (13.7V 500mW), Voltage Stabilization for Meter (XZ-137)	AB
ZD903	VHERD3R6EC/-1	Zener (3.6V 400mW), Voltage Stabilization for Meter (RD3.6EC)	AB
ZD951	VHE02Z6R8A/-1	Zener (6.8V, 250mW), Meter Muting Circuit (02Z6R8A)	AB

COILS

REF. NO.	PART NO.	DESCRIPTION	CODE
L101, L201, L102, L202, L103, L203	RCILZ0019AGZZ	6.8mH, Equalizer	AC
L301, L302	RCILB0376AFZZ	Bias Step-up	AE
L303	RCILB0086AGZZ	Bias Oscillator	AE
L401, L402	RCILZ0062AFZZ	100μH, Noise Killer	AC

TRANSFORMER

REF. NO.	PART NO.	DESCRIPTION	CODE
ΔT501	RTRNP0623AFZZ	Power	BE

FILTERS

REF. NO.	PART NO.	DESCRIPTION	CODE
FL101, FL201	RCILL0058AFZZ	Multiplex Filter	AH

VIBRATORS

REF. NO.	PART NO.	DESCRIPTION	CODE
X1	RCRSB0062AFZZ	Crystal (32.768kHz), Clock Oscillator	AK

THERMISTOR

REF. NO.	PART NO.	DESCRIPTION	CODE
TH501	VHH31D26///-1	1K ohm, Positive Temperature Coefficient	AB

CONTROLS

REF. NO.	PART NO.	DESCRIPTION	CODE
VR101, VR201	RVR-M0128AFZZ	20K ohm (B), Playback Sensitivity Adjustment	AC
VR102, VR202	RVR-M0127AFZZ	10K ohm (B), Playback Amplifier Frequency Characteristic Adjustment	AC
VR103, VR203	RVR-A0117AFZZ	50K ohm (A) x 2, Line/DIN Recording Level Control	AM
VR104, VR204	RVR-A0124AFZZ	20K ohm (A) x 2, Microphone Recording Level Control	AM
VR105, VR205	RVR-M0127AFZZ	10K ohm (B), Record Amplifier Sensitivity Adjustment	AC
VR106, VR206	RVR-M0127AFZZ	10K ohm (B), Record Amplifier Frequency Characteristic Adjustment	AC
VR107, VR207	RVR-M0128AFZZ	20K ohm (B), Record/Playback Frequency Adjustment	AC
VR108, VR208	RVR-B0151AFZZ	10K ohm (B) x 2, Output Volume Control	AH
VR301, VR302	RVR-M0127AFZZ	10K ohm (B), Bias Current Adjustment	AC
VR401	RVR-M0152AFZZ	1K ohm (B), Wind Motor Control Frequency Adjustment	AC
VR501	RVR-M0151AFZZ	500 ohm (B), Voltage (3V) Adjustment	AC
VR901, VR902	RVR-M0130AFZZ	50K ohm (B), OPTO Peak Level Meter Sensitivity Adjustment	AC

ELECTROLYTIC CAPACITORS

REF. NO.	PART NO.	DESCRIPTION	CODE
C5, C6, C7	VCEALV1HC104M	.1MFD, 50V, ±20%, LR	AC
C8	VCEALV1HC105M	1MFD, 50V, ±20%, LR	AC
C9	VCEALV1CC106M	10MFD, 16V, ±20%, LR	AC
C10	VCEAAV1AW107Y	100MFD, 10V, +50 –10%	AB
C11	VCEAAV0JW227Y	220MFD, 6.3V, +50 –10%	AB
C13	VCEAAV1CW476Y	47MFD, 16V, +50 –10%	AB
C19	VCEALV1CC106M	10MFD, 16V, ±20%, LR	AC
C20	VCEAAV0JW227Y	220MFD, 6.3V, +50 –10%	AB
C21	VCEAAV1AW107Y	100MFD, 10V, +50 –10%	AB
C22	VCEALV1HC105M	1MFD, 50V, ±20%, LR	AC
C103, C203	VCEALV1CC106M	10MFD, 16V, ±20%, LR	AC
C105, C205	VCEAAV1AW476Y	47MFD, 10V, +50 –10%	AB
C108, C208	VCEALV1CC106M	10MFD, 16V, ±20%, LR	AC
C110, C210	VCEALV1CC106M	10MFD, 16V, ±20%, LR	AC
C111, C211	VCEAAU0JW227Y	220MFD, 6.3V, +50 –10%	AC
C112, C212	VCEALV1CC106M	10MFD, 16V, ±20%, LR	AC
C113, C213	VCEAAV1HW105M	1MFD, 50V, ±20%, LR	AB

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	CODE
C114, C214	VCEAAV1CW106Y	10MFD, 16V, +50 –10%	AB
C115, C215	VCEALV1HC105M	1MFD, 50V, ±20%, LR	AC
C116, C216	VCEAAV1CW227Y	220MFD, 16V, +50 –10%	AC
C121, C221	VCEAAV1CW106Y	10MFD, 16V, +50 –10%	AB
C125, C225	VCEAAV1CW106Y	10MFD, 16V, +50 –10%	AB
C127, C227	VCEALV1HC334K	.33MFD, 50V, ±10%, LR	AC
C129, C229	VCEAAV1CW106Y	10MFD, 16V, +50 –10%	AB
C130, C230	VCEAAV1CW106Y	10MFD, 16V, +50 –10%	AB
C131, C231	VCEAAV1CW106Y	10MFD, 16V, +50 –10%	AB
C135, C235	VCEAAV1CW106Y	10MFD, 16V, +50 –10%	AB
C140, C240	VCEALA1HW104M	.1MFD, 50V, ±20%, LL	AB
C141, C241	VCEAAV1HW105A	1MFD, 50V, +75 –10%	AB
C142, C242	VCEAAA1EW475A	4.7MFD, 25V, +75 –10%	AB
C144, C244	VCEAAV1CW106Y	10MFD, 16V, +50 –10%	AB
C145, C245	VCEAAV1CW227Y	220MFD, 16V, +50 –10%	AC
C147, C247	VCEAAV1CW106Y	10MFD, 16V, +50 –10%	AB
C151, C251	VCEAAV1CW106Y	10MFD, 16V, +50 –10%	AB
C303	VCEAAA1EW335A	.33MFD, 25V, +75 –10%	
C308	VCEALA1HW104M	.1MFD, 50V, ±20%, LL	AB
C309	VCEAAU1EW107Y	100MFD, 25V, +50 –10%	AC
C401	VCEAAU1CW107Y	100MFD, 16V, +50 –10%	AB
C404	VCEAAU1CW476Y	47MFD, 16V, +50 –10%	AB
C405	VCEAAU1CW476Y	47MFD, 16V, +50 –10%	AB
C406	VCEALV1HC105M	1MFD, 50V, ±20%, LR	AC
C407	VCEALV1HC105M	1MFD, 50V, ±20%, LR	AC
C408	VCEALV1CC106M	10MFD, 16V, ±20%, LR	AC
C409	VCEALV1HC105M	1MFD, 50V, ±20%, LR	AC
C413	VCEALV1HC225M	2.2MFD, 50V, ±20%, LR	AB
C414	VCEAAV1EC475K	4.7MFD, 25V, ±10%, LR	AC
C415	VCEAAV1EC475K	4.7MFD, 25V, ±10%, LR	AC
C416	VCEAAU1EW107Y	100MFD, 25V, +50 –10%	AC
C501	VCEAAW1VW477Y	470MFD, 35V, +50 –10%	AC
C502	VCEAAV1EW227Y	220MFD, 25V, +50 –10%	AC
C504	VCEAAW1VW477Y	470MFD, 35V, +50 –10%	AC
C510	VCEAAW1VW477Y	470MFD, 35V, +50 –10%	AC
C511	VCEAAV1CW227Y	220MFD, 16V, +50 –10%	AC
C512	VCEAAV1CW477Y	470MFD, 16V, +50 –10%	AC
C513	VCEAAV1AW227Y	220MFD, 10V, +50 –10%	AC
C516	VCEAAV1CW477Y	470MFD, 16V, +50 –10%	AC
C517	VCEAAV1CW106Y	10MFD, 16V, +50 –10%	AB
C518	VCEAAV1AW227Y	220MFD, 10V, +50 –10%	AC
C519	RC-EZ1123AFZZ	2200MFD, 50V, ±20%	AL
C520	VCEAAW1VW477Y	470MFD, 35V, +50 –10%	AC
C521	VCEAAV1CW227Y	220MFD, 16V, +50 –10%	AC
C522	VCEAAV1CW477Y	470MFD, 16V, +50 –10%	AB
C523	VCEAAV1EW107Y	100MFD, 25V, +50 –10%	AC
C524	VCEAAV1AW227Y	220MFD, 10V, +50 –10%	AC
C525	VCEAAV1AW476Y	47MFD, 10V, +50 –10%	AB

REF. NO.	PART NO.	DESCRIPTION	CODE
C528	VCEAAU1EW108Y	1000MFD, 25V, +50 –10%	AE
C529	VCEAAV1EW336Y	33MFD, 25V, +50 –10%	AC
C530	VCEAAU1EW107Y	100MFD, 25V, +50 –10%	AC
C531	VCEAAV1CW477Y	470MFD, 16V, +50 –10%	AC
C532	VCEAAV1CW477Y	470MFD, 16V, +50 –10%	AC
C533	VCEAAU1EW107Y	100MFD, 25V, +50 –10%	AC
C534	VCEAAU1EW107Y	100MFD, 25V, +50 –10%	AC
C535	VCEAAV1CW227Y	220MFD, 16V, +50 –10%	AC
C536	VCEAAU1EW107Y	100MFD, 25V, +50 –10%	AC
C537	VCEAAU1EW107Y	100MFD, 25V, +50 –10%	AC
C538	VCEAAU1EW107Y	100MFD, 25V, +50 –10%	AC
C601	VCEAAV1HW335A	3.3MFD, 50V, +75 –10%	AB
C602	VCEAAV1VW106Y	10MFD, 35V, +50 –10%	AC
C603	VCEAAV1EW336Y	33MFD, 25V, +50 –10%	AB
C604	VCEAAU1CW336Y	33MFD, 16V, +50 –10%	
C605	VCEAAU1VW107Y	100MFD, 35V, +50 –10%	AC
C606	VCEAAU1CW106Y	10MFD, 16V, +50 –10%	AB
C607	VCEAAU1HW105A	1MFD, 50V, +75 –10%	AB
C701	VCEALA1HW104M	.1MFD, 50V, ±20%, LL	AB
C702	VCEAAA1EW475A	4.7MFD, 25V, +75 –10%	AB
C704	VCEALA1HW105M	1MFD, 50V, ±20%, LL	AB
C705	VCEAAU1EW476Y	47MFD, 25V, +50 –10%	AB
C730	VCEAAV1CW106Y	10MFD, 16V, +50 –10%	AB
C912	VCEAAV1HW105A	1MFD, 50V, +75 –10%	AB
C913	VCEAAV1HW106Y	10MFD, 50V, +50 –10%	AB
C914	VCEAAV1HW475A	4.7MFD, 50V, +75 –10%	AB
C915	VCEAAU1EW107Y	100MFD, 25V, +50 –10%	AC
C916	VCEAAV1EW337Y	330MFD, 25V, +50 –10%	AC
C918	VCEAAV1AW107Y	100MFD, 10V, +50 –10%	AB
C919	VCEAAU1VW227Y	220MFD, 35V, +50 –10%	AB
C920	VCEAAU1EW107Y	100MFD, 25V, +50 –10%	AC

CAPACITORS

(Unless otherwise specified capacitors are 50V, +80 –20%, Ceramic Type.)

REF. NO.	PART NO.	DESCRIPTION	CODE
C1	VCKZPU1HF403Z	.04MFD	
C2	VCKYAT1HB471K	470PF, 50V, ±10%, Semiconductor	
C3	VCKYAT1HB331K	330PF, 50V, ±10%, Semiconductor	
C4	VCQYKU1HM104M	.1MFD, 50V, ±20%, Mylar	AC
C12	VCQYKU1HM104M	.1MFD, 50V, ±20%, Mylar	AC
C14	VCQYKU1HM222M	.0022MFD, 50V, ±20%, Mylar	AA
C15	VCQYKU1HM222M	.0022MFD, 50V, ±20%, Mylar	AA
C16	VCQYKU1HM104M	.1MFD, 50V, ±20%, Mylar	AC
C17	VCKZPU1HF403Z	.04MFD	
C18	VCQYKU1HM102M	.001MFD, 50V, ±20%, Mylar	AA
C23	VCKZPU1HF403Z	.04MFD	
C101, C201	VCKZPU1HF102Z	.001MFD	
C102, C202	VCKYKT1HB331K	330PF, 50V, ±10%, Semiconductor	
C104, C204	VCCSAT1HL101J	100PF, 50V, ±5%, Semiconductor	
C106, C206	VCQYKU1HM103J	.01MFD, 50V, ±5%, Mylar	AB
C107, C207	VCCSAT1HL330J	33PF, 50V, ±5%, Semiconductor	
C109, C209	VCQYKU1HM222K	.0022MFD, 50V, ±10% Mylar	AA
C117, C217	VCCSPU1HL391J	390PF, 50V, ±5%, Ceramic	

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	CODE
C118, C218	VCKYAT1HB471K	470PF, 50V, ±10%, Semiconductor	
C119, C219	VCQYKU1HM562J	.0056MFD, 50V, ±5%, Mylar	AB
C120, C220	VCQYKU1HM273J	.027MFD, 50V, ±5%, Mylar	AB
C122, C222	VCQYKU1HM472J	.0047MFD, 50V, ±5%, Mylar	AB
C123, C223	VCQYKU1HM473J	.047MFD, 50V, ±5%, Mylar	AB
C124, C224	VCKYAT1HD102M	1000PF, 50V, ±20%, Semiconductor	
C126, C226	VCQYKU1HM104K	.1MFD, 50V, ±10%, Mylar	AB
C128, C228	VCQYKU1HM102K	.001MFD, 50V, ±20%, Mylar	AA
C132, C232	VCQYKU1HM122K	.0012MFD, 50V, ±20%, Mylar	AA
C133, C233	VCQYKU1HM153J	.015MFD, 50V, ±5%, Mylar	AB
C136, C236	VCQYKU1HM103J	.01MFD, 50V, ±5%, Mylar	AB
C137, C237	VCQYKU1HM123K	.012MFD, 50V, ±10%, Mylar	AA
C138, C238	VCQYKU1HM123J	.012MFD, 50V, ±5%, Mylar	AB
C139, C239	VCQYKU1HM392K	.0039MFD, 50V, ±10%, Mylar	AA
C143, C243	VCKZPU1HF102Z	.001MFD	
C146, C246	VCQYKU1HM103K	.01MFD, 50V, ±10%, Mylar	AA
C148	VCKZPU1HF102Z	.001MFD	
C150, C250	VCQYKU1HM103M	.01MFD, 50V, ±20%, Mylar	AB
C301	VCKYAT1HB561K	560PF, 50V, ±10%, Semiconductor	
C302	VCKYAT1HB561K	560PF, 50V, ±10%, Semiconductor	
C304	VCQYKU1HM272K	.0027MFD, 50V, ±10%, Mylar	AA
C305	VCQYKU1HM272K	.0027MFD, 50V, ±10%, Mylar	AA
C306	VCQYKU1HM223J	.022MFD, 50V, ±5%, Mylar	AB
C307	VCQYKU1HM103K	.01MFD, 50V, ±10%, Mylar	AA
C402, C403	VCKZPU1HF223Z	.022MFD	
C410	VCKZPU1HF103Z	.01MFD	
C411, C412	VCKZPU1HF203Z	.02MFD	
C503	VCKZPU1HF403Z	.04MFD	
C505	VCKZPU1HF403Z	.04MFD	
C506	VCKZPU1HF403Z	.04MFD	
C507	RC-HZ053CAFZZ	.01MD, 250V, ±20%, Metalized Paper	AG
C508	VCKZPU1HF102Z	.001MFD	
C509	VCKZPU1HF403Z	.04MFD	
C514	VCKZPU1HF403Z	.04MFD	
C515	VCKZPU1HF403Z	.04MFD	
C526	VCKZPU1HF403Z	.04MFD	
C527	VCKZPU1HF403Z	.04MFD	
C703	VCCSAT1HL470J	47PF, 50V, ±5%, Semiconductor	
C917	VCKZPU1HF403Z	.04MFD	

RESISTORS

(Unless otherwise specified resistors are 1/4W, ±5%, Carbon type.)

REF. NO.	PART NO.	DESCRIPTION	CODE
R1	VRD-ST2EE683J	68K ohm	AA
R2	VRD-SU2EE153J	15K ohm	
R3	VRD-ST2EE223J	22K ohm	
R4	VRD-ST2EE682J	6.8K ohm	
R5	VRD-ST2EE223J	22K ohm	
R6	VRD-ST2EE472J	4.7K ohm	
R7	VRD-ST2EE683J	68K ohm	
R8	VRD-ST2EE153J	15K ohm	
R9	VRD-ST2EE223J	22K ohm	
R10	VRD-ST2EE683J	68K ohm	
R11	VRD-ST2EE153J	15K ohm	
R12	VRD-ST2EE223J	22K ohm	
R13	VRD-ST2EE181J	180 ohm	
R14	VRD-ST2EE181J	180 ohm	
R15	VRD-ST2EE181J	180 ohm	
R16	VRD-ST2EE181J	180 ohm	
R17	VRD-ST2EE181J	180 ohm	
R18	VRD-ST2EE391J	390 ohm	
R19	VRD-ST2EE181J	180 ohm	
R20	VRD-ST2EE181J	180 ohm	
R21	VRD-ST2EE562J	5.6K ohm	
R22	VRD-ST2EE152J	1.5K ohm	
R23	VRD-ST2EE223J	22K ohm	
R24	VRD-ST2EE183J	18K ohm	
R25	VRD-ST2EE183J	18K ohm	
R26	VRD-SU2EE332J	3.3K ohm	
R27	VRD-ST2EE333J	33K ohm	
R28	VRD-ST2EE223J	22K ohm	
R29	VRD-ST2EE183J	18K ohm	
R30	VRD-ST2EE183J	18K ohm	
R31	VRD-ST2EE475J	4.7 Meg ohm	
R32	VRD-ST2EE102J	1K ohm	
R33	VRD-ST2EE223J	22K ohm	
R34	VRD-ST2EE101J	100 ohm	
R35	VRD-ST2EE473J	47K ohm	
R36	VRD-ST2EE102J	1K ohm	
R37	VRD-ST2EE101J	100 ohm	
R38	VRD-ST2EE394J	390K ohm	
R39	VRD-ST2EE102J	1K ohm	
R40	VRD-ST2EE222J	2.2K ohm	
R41	VRD-ST2EE563J	56K ohm	
R42	VRD-SU2EE563J	56K ohm	
R43	VRD-SU2EE683J	68K ohm	
R44	VRD-ST2EE103J	10K ohm	
R45	VRD-ST2EE563J	56K ohm	
R46	VRD-ST2EE683J	68K ohm	
R47	VRD-ST2EE273J	27K ohm	
R48	VRD-ST2EE563J	56K ohm	
R49	VRD-SU2EE183J	18K ohm	
R50	VRD-ST2EE563J	56K ohm	
R51	VRD-SU2EE102J	1K ohm	
R52	VRD-ST2EE103J	10K ohm	
R53	VRD-ST2EE153J	15K ohm	
R54	VRD-ST2EE223J	22K ohm	
R55	VRD-ST2EE472J	4.7K ohm	
R56	VRD-ST2EE103J	10K ohm	
R57	VRD-ST2EE682J	6.8K ohm	
R58	VRD-ST2EE683J	68K ohm	
R59	VRD-ST2EE101J	100 ohm	
R60	VRD-ST2EE562J	5.6K ohm	
R61	VRD-ST2EE103J	10K ohm	

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	CODE
R62	VRD-ST2EE223J	22K ohm	AA
R63	VRD-ST2EE683J	68K ohm	
R64	VRD-ST2EE102J	1K ohm	
R65	VRD-ST2EE103J	10K ohm	
R66	VRD-ST2EE823J	82K ohm	
R67	VRD-ST2EE823J	82K ohm	
R68	VRD-ST2EE332J	3.3K ohm	
R69	VRD-ST2EE103J	10K ohm	
R70	VRD-SU2EE274J	270K ohm	
R71	VRD-ST2EE274J	270K ohm	
R72	VRD-SU2EE393J	39K ohm	
R74	VRD-SU2EE103J	10K ohm	
R75	VRD-SU2EE183J	18K ohm	
R76	VRD-ST2EE182J	1.8K ohm	
R101, R201	VRD-ST2EE101J	100 ohm	
R102, R202	VRD-ST2EE223J	22K ohm	
R103, R203	VRD-SU2EE682J	6.8K ohm	
R104, R204	VRD-ST2EE184J	180K ohm	
R105, R205	VRD-ST2EE184J	180K ohm	
R106, R206	VRD-ST2EE101J	100 ohm	
R107, R207	VRD-ST2EE105J	1Meg ohm	
R108, R208	VRD-ST2EE123J	12K ohm	
R109, R209	VRD-ST2EE123J	12K ohm	
R110, R210	VRD-ST2EE153J	15K ohm	
R112, R212	VRD-ST2EE154J	150K ohm	
R113, R213	VRD-ST2EE821J	820 ohm	
R114, R214	VRD-ST2EE103J	10K ohm	
R115	VRD-ST2EE223J	22K ohm	
R215	VRD-SU2EE223J	22K ohm	
R116	VRD-ST2EE473J	47K ohm	
R216	VRD-SU2EE473J	47K ohm	
R117, R217	VRD-ST2EE334J	330K ohm	
R118, R218	VRD-ST2EE562J	5.6K ohm	
R119, R219	VRD-ST2EE101J	100 ohm	
R120, R220	VRD-ST2EE821J	820 ohm	
R121, R221	VRD-ST2EE104J	100K ohm	
R122, R222	VRD-ST2EE473J	47K ohm	
R123, R223	VRD-ST2EE185J	1.8Meg ohm	
R124, R224	VRD-ST2EE123J	12K ohm	
R125, R225	VRD-ST2EE332J	3.3K ohm	
R126, R226	VRD-SU2EE104J	100K ohm	
R127, R227	VRD-SU2EE105J	1Meg ohm	AA
R128	VRD-SU2EE102J	1K ohm	
R228	VRD-ST2EE102J	1K ohm	
R129	VRD-ST2EE102J	1K ohm	
R229	VRD-SU2EE102J	1K ohm	
R130, R230	VRD-ST2EE332J	3.3K ohm	
R131, R231	VRD-ST2EE473J	47K ohm	
R132, R232	VRD-ST2EE184J	180K ohm	
R133, R233	VRD-ST2EE274J	270K ohm	
R134, R234	VRD-ST2EE181J	180 ohm	
R136, R236	VRD-SU2EE332J	3.3K ohm	
R137, R237	VRD-SU2EE562J	5.6K ohm	
R138	VRD-SU2EE392J	3.9K ohm	
R238	VRD-ST2EE392J	3.9K ohm	
R141, R241	VRD-ST2EE474J	470K ohm	
R142, R242	VRD-ST2EE393J	39K ohm	
R143, R243	VRD-ST2EE223J	22K ohm	
R144, R244	VRD-ST2EE680J	68 ohm	
R146, R246	VRD-ST2EE272J	2.7K ohm	
R147	VRD-ST2EE820J	82 ohm	
R247	VRD-SU2EE820J	82 ohm	
R148	VRD-ST2EE682J	6.8K ohm	
R248	VRD-SU2EE682J	6.8K ohm	
R149, R249	VRD-ST2EE682J	6.8K ohm	
R150	VRD-ST2EE820J	82 ohm	
R250	VRD-SU2EE820J	82 ohm	
R151	VRD-ST2EE103J	10K ohm	
R251	VRD-SU2EE103J	10K ohm	
R152, R252	VRD-ST2EE472J	4.7K ohm	
R153, R253	VRD-ST2EE104J	100K ohm	
R154, R254	VRD-ST2EE223J	22K ohm	
R155, R255	VRD-ST2EE332J	3.3K ohm	
R156, R256	VRD-SU2EE103J	10K ohm	
R157, R257	VRD-SU2EE561J	560 ohm	
R158, R258	VRD-SU2EE102J	1K ohm	
R159, R259	VRD-ST2EE104J	100K ohm	
R160, R260	VRD-ST2HD560J	56 ohm, 1/2W, ±5%, Carbon	
R161, R261	VRD-ST2EE123J	12K ohm	
R162, R262	VRD-SU2EE333J	33K ohm	
R301	VRD-ST2EE1R0J	1 ohm	

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	CODE
R302	VRD-ST2EE180J	18 ohm	AA
R303	VRD-ST2EE104J	100K ohm	
R304	VRD-ST2EE104J	100K ohm	
R305	VRD-ST2EE222J	2.2K ohm	
R306	VRD-ST2EE103J	10K ohm	
R309	VRS-PT3AB221K	220 ohm, 1W, ±10%, Carbon	
R310	VRD-ST2EE273J	27K ohm	
R401	VRD-ST2EE681J	680 ohm	
R402	VRD-ST2EE103J	10K ohm	
R403	VRD-ST2EE273J	27K ohm	
R404	VRD-ST2EE103J	10K ohm	
R405	VRD-ST2EE332J	3.3K ohm	
R406	VRD-ST2EE223J	22K ohm	
R407	VRD-ST2EE223J	22K ohm	
R408	VRD-ST2EE153J	15K ohm	
R409	VRD-ST2EE223J	22K ohm	
R410	VRD-ST2EE103J	10K ohm	
R411	VRD-ST2EE681J	680 ohm	
R412	VRD-ST2EE183J	18K ohm	
R413	VRD-ST2EE103J	10K ohm	
R414	VRD-ST2EE102J	1K ohm	
R415	VRD-ST2EE103J	10K ohm	
R416	VRD-ST2EE273J	27K ohm	
R417	VRD-ST2EE103J	10K ohm	
R418	VRD-ST2EE332J	3.3K ohm	
R419	VRD-ST2EE223J	22K ohm	
R420	VRD-ST2EE223J	22K ohm	
R421	VRD-ST2EE153J	15K ohm	
R422	VRD-ST2EE223J	22K ohm	
R423	VRD-ST2EE103J	10K ohm	
R424	VRD-ST2EE681J	680 ohm	
R425	VRD-ST2EE183J	18K ohm	
R426	VRD-ST2EE103J	10K ohm	
R427	VRD-ST2EE102J	1K ohm	
R428	VRD-ST2EE103J	10K ohm	
R429	VRD-ST2EE103J	10K ohm	
R430	VRD-ST2EE102J	1K ohm	
R431	VRD-ST2EE273J	27K ohm	
R432	VRD-ST2EE103J	10K ohm	
R433	VRD-ST2EE332J	3.3K ohm	
R434	VRD-ST2EE223J	22K ohm	
R435	VRD-ST2EE223J	22K ohm	
R436	VRD-ST2EE153J	15K ohm	
R437	VRD-ST2EE273J	27K ohm	
R438	VRD-ST2EE103J	10K ohm	
R439	VRD-ST2EE681J	680 ohm	
R440	VRD-ST2EE183J	18K ohm	
R441	VRD-ST2EE103J	10K ohm	
R442	VRD-ST2EE102J	1K ohm	
R443	VRD-ST2EE391J	390 ohm	
R444	VRD-ST2EE122J	1.2K ohm	
R445	VRD-ST2EE102J	1K ohm	
R446	VRD-ST2EE561J	560 ohm	
R447	VRD-ST2EE332J	3.3K ohm	
R448	VRD-ST2EE102J	1K ohm	
R449	VRD-ST2EE273J	27K ohm	
R450	VRD-ST2EE102J	1K ohm	
R451	VRD-ST2EE471J	470 ohm	
R452	VRD-ST2EE273J	27K ohm	
R453	VRD-ST2EE561J	560 ohm	
R454	VRD-ST2EE822J	8.2K ohm	
R455	VRD-ST2EE472J	4.7K ohm	
R456	VRD-ST2EE103J	10K ohm	
R457	VRD-ST2EE153J	15K ohm	
R458	VRD-ST2EE681J	680 ohm	

REF. NO.	PART NO.	DESCRIPTION	CODE
R459	VRD-ST2EE681J	680 ohm	AA
R460	VRD-ST2EE153J	15K ohm	
R461	VRD-ST2EE681J	680 ohm	
R462	VRD-ST2EE153J	15K ohm	
R463	VRD-ST2EE153J	15K ohm	
R464	VRD-ST2EE681J	680 ohm	
R465	VRD-ST2EE103J	10K ohm	
R466	VRD-ST2EE472J	4.7K ohm	
R467	VRD-ST2EE103J	10K ohm	
R468	VRD-ST2EE472J	4.7K ohm	
R469	VRD-ST2EE562J	5.6K ohm	
R470	VRD-ST2EE102J	1K ohm	
R471	VRD-ST2EE222J	2.2K ohm	
R501	VRS-PT3DB561K	560 ohm, 2W, ±10%, Metal Oxide Film	
R502	VRD-ST2EE330J	33 ohm	
R503	VRS-PT3AB101K	100 ohm, 1W, ±10%, Metal Oxide Film	
R504	VRS-PT3DB181K	180 ohm, 2W, ±10%, Metal Oxide Film	
R505	VRD-ST2HD561J	560 ohm, 1/2W, ±5%, Carbon	
R507	VRD-ST2EE471J	470 ohm	
R508	VRD-ST2EE222J	2.2K ohm	
R509	VRD-ST2EE102J	1K ohm	
R510	VRS-PT3DB181K	180 ohm, 2W, ±10%, Metal Oxide Film	
R511	VRD-ST2EE101J	100 ohm	
R513	VRD-ST2HD681J	680 ohm 1/2W, ±5%, Carbon	
R514	VRS-PT3AB391K	390 ohm, 1W, ±10%, Metal Oxide Film	
⚠R515	VRG-ST2HA5R6J	5.6 ohm, 1/2W, ±5%, Fusible	AB
R516	VRS-PT3AB470K	47 ohm, 1W, ±10%, Metal Oxide Film	AA
R517	VRD-ST2EE102J	1K ohm	
R518	VRD-ST2EE102J	1K ohm	
R519	VRS-PT3AB181K	180 ohm, 1W, ±10%, Metal Oxide Film	
R520	VRS-PT3AB181K	180 ohm, 1W, ±10%, Metal Oxide Film	
⚠R521	VRG-ST2HA100J	10 ohm, 1/2W, ±5%, Fusible	AB
R522	VRD-ST2EE102J	1K ohm	AA
⚠R523	VRG-ST2HA4R7J	4.7 ohm, 1/2W, ±5%, Fusible	AB
R525	VRD-ST2EE102J	1K ohm	AA
R526	VRD-ST2EE473J	47K ohm	AA
R601	VRD-ST2EE222J	2.2K ohm	AA
R602	VRD-ST2EE222J	2.2K ohm	
R603	VTD-ST2EE273J	27K ohm	
R604	VRD-SU2EE222J	2.2K ohm	
R605	VRD-ST2EE273J	27K ohm	
R606	VRD-SU2EE102J	1K ohm	
R607	VRD-ST2EE222J	2.2K ohm	
R608	VRD-ST2EE273J	27K ohm	
R609	VRD-ST2EE222J	2.2K ohm	
R610	VRD-ST2EE102J	1K ohm	
R611	VRD-ST2EE222J	2.2K ohm	
R612	VRD-ST2EE104J	100K ohm	
R613	VRD-ST2EE563J	56K ohm	
R615	VRD-ST2EE473J	47K ohm	
R616	VRD-ST2EE223J	22K ohm	
R617	VRD-ST2EE153J	15K ohm	
R618	VRD-ST2EE332J	3.3K ohm	
R619	VRD-ST2EE222J	2.2K ohm	
R620	VRD-ST2EE222J	2.2K ohm	
R621	VRD-ST2EE222J	2.2K ohm	
R630	VRD-SU2EE103J	1K ohm	

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	CODE
R631	VRD-SU2EE102J	1K ohm	AA
R632	VRD-SU2EE102J	1K ohm	
R633	VRD-SU2EE102J	1K ohm	
R634	VRD-SU2EE102J	1K ohm	
R701	VRD-ST2EE273J	27K ohm	
R702	VRD-ST2EE273J	27K ohm	
R703	VRD-ST2EE223J	22K ohm	
R704	VRD-ST2EE223J	22K ohm	
R705	VRD-ST2EE273J	27K ohm	
R706	VRD-ST2EE332J	3.3K ohm	
R707	VRD-ST2EE273J	27K ohm	
R708	VRD-ST2EE224J	220K ohm	
R709	VRD-ST2EE121J	120 ohm	
R710	VRD-ST2EE223J	22K ohm	
R711	VRD-ST2EE562J	5.6K ohm	
R712	VRD-ST2EE101J	1K ohm	
R713	VRD-ST2EE821J	820 ohm	
R714	VRD-ST2EE151J	150 ohm	
R715	VRD-ST2EE103J	10K ohm	
R716	VRD-ST2EE102J	1K ohm	
R717	VRD-ST2EE473J	47K ohm	
R718	VRD-ST2EE273J	27K ohm	
R719	VRD-ST2EE183J	18K ohm	
R720	VRD-ST2EE103J	10K ohm	
R721	VRD-ST2EE222J	2.2K ohm	
R918	VRD-ST2EE103J	10K ohm	
R919	VRD-ST2EE564J	560K ohm	
R920	VRD-ST2EE105J	1Meg ohm	
R921	VRD-ST2EE103J	10K ohm	
R922	VRD-ST2EE223J	22K ohm	
R923	VRD-ST2EE103J	10K ohm	
R924	VRD-ST2EE562J	5.6K ohm	
R925	VRD-ST2EE103J	10K ohm	
R926	VRD-ST2HD182J	1.8K ohm, 1/2W, ±5%, Carbon	
R929	VRD-ST2EE1R0J	1 ohm	
R930	VRD-ST2EE1R0J	1 ohm	
⚠R932	VRG-ST2HA100J	10 ohm, 1/2W, ±5%, Fusible	AB
R951	VRD-ST2EE273J	27K ohm	AA
R952	VRD-ST2EE222J	2.2K ohm	
R953	VRD-ST2EE222J	2.2K ohm	
R954	VRD-ST2EE222J	2.2K ohm	

MECHANICAL PARTS

REF. NO.	PART NO.	DESCRIPTION	CODE
001	LANGF0500AFZZ	Arm, Cassette Holder (Left Side)	AE
002	LANGF0501AFZZ	Arm, Cassette Holder (Right Side)	AE
003	LANGF0503AFZZ	Bracket, Cassette Holder (Left Side)	AF
004	LANGF0504AFZZ	Bracket, Cassette Holder (Right Side)	AF
005	LANGF0505AFZZ	Bracket, Sub Chassis Stopper	AC
006	LANGF0506AFZZ	Timing Plate	AC
007	LANGF0507AFZZ	Plate, Capstan Solenoid Retaining	AC
008	LANGF0508AFZZ	Plate, Reel Solenoid Retaining	AB
009	LANGF0509AFZZ	Bracket, Eject Lever/P.W. Board Retaining	AH
010	LANGF0522AFZZ	Bracket, Cassette Holder Lock	AC
011	LANGT0820AFZZ	Bracket, Micro Switch Retaining	AE
012	LANGT0822AFZZ	Bracket, Reel Motor Retaining	AD
013	LANGT0823AFZZ	Bracket, Capstan Motor Retaining	AC
014	LANGT0827AFZZ	Bracket, Lamp	AC
015	LANGT0863AFZZ	Plate, Erase Head	AH
016	LANGT0871AFZZ	Bracket, Flywheel	AK
017	LBSHZ0055AFZZ	Collar, Cassette Holder	AB
018	LBSHZ0056AFZZ	Lamp Holder	AC
019	LCHSM0318AFZZ	Main Chassis	—
020	LCHSS0147AFZZ	Sub Chassis	—
021	LHLDX1051AFZZ	Cassette Holder Assembly	AN
022	LHLDX1052AFZZ	Back Plate, Cassette Holder	AH
023	LHLDZ1089AFZZ	Holder, Hall IC (IC401)	AB
024	LSLVM0077AFFW	Sleeve, Record/Playback Head Retaining	AB
025	LSLVM0081AFFW	Sleeve, Cassette Detect Lever	AB
026	LSLVM0082AFFW	Sleeve, Air Damper Lever	AB
027	LX-BZ0273AFFW	Screw, Micro Switch Retaining	AE
028	LX-BZ0274AFZZ	Screw, Flywheel Thrust Adjustment	AC
029	LX-NZ0133AFFW	Adjusting Nut, Pinch Roller	AC
030	LX-WZ5020AGZZ	Washer, 1.7W3.2–0.25	AA
031	LX-WZ9060AFZZ	Washer, Oil Cut 3W5–0.4	AA
032	LX-WZ9061AFZZ	Washer, 2.2W6–0.2	AA
033	LX-WZ9062AFZZ	Washer, 3.2W7–0.35	AA
034	MLEVF0935AFZZ	Lever, Play	AC
035	MLEVF0936AFZZ	Lever, Play	AD
036	MLEVF0937AFZZ	Lever, Idler Release	AB
037	MLEVF0938AFZZ	Lever, APSS	AC
038	MLEVF0939AFZZ	Lever, Fast Forward/Rewind	AD
039	MLEVF0940AFZZ	Lever, Reel Solenoid	AB
040	MLEVF0941AFZZ	Lever, Cassette Hold	AE
041	MLEVF0942AFZZ	Lever, Cassette Holder Lock	AF
042	MLEVF0943AFZZ	Lever, Eject	AD
043	MLEVF0944AFZZ	Lever, Air Damper	AD
044	MLEVF0949AFZZ	Lever, Cassette Detect Switch	AD
045	MLEVF0950AFZZ	Lever, Cassette Detection	AD
046	MLEVF0951AFZZ	Lever, Switch Connection	AD
047	MLEVF0967AFZZ	Lever, Air Damper	AD
048	MLEVP0064AFZZ	Guide, Take-up Idler	AD
049	MLEVP0155AFZZ	Lever, Cassette Loading Switch	AC
050	MLEVP0156AFZZ	Lever, Record Fool Proof Switch	AB
051	MLIFP0005AFZZ	Air Damper	
052	MRODM0068AFZZ	Rod, Cassette Detect Switch Lever	AB
053	LHLDW3062AFZZ	Wire Holder	AA
054	MSPRC0180AFFJ	Spring, Pinch Roller	AB
055	MSPRC0181AFFJ	Spring, Record/Playback Head	AB
056	MSPRC0182AFFJ	Spring, Erase Head	AB
057	MSPRT0618AFFJ	Spring, Air Damper Lever	AB
058	MSPRD0212AFFJ	Spring, Cassette Holder Lock Lever	AB
059	MSPRD0228AFFJ	Spring, Cassette Detect Lever	AB
060	LHLDW3063AFZZ	Wire Holder	AA
062	MSPRP0214AFFW	Spring (Plate type), Sub Chassis Hold	AC
063	MSPRT0586AFFJ	Spring, Pinch Roller Pressure (Right Side)	AB
064	MSPRT0588AFFJ	Spring, Take-up Idler	AA
065	MSPRT0589AFFJ	Spring, Sub Chassis Return	AA
066	MSPRT0590AFFJ	Spring, Fast Forward/Rewind Roller Guide	AB
067	MSPRT0591AFFJ	Spring, APSS Lever	AA
068	MSPRT0592AFFJ	Spring, Cassette Hold Lever	AA
069	MSPRT0593AFFJ	Spring, Eject Lever	AB

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	CODE
070	NBALS0004AGFJ	Steel Ball (ϕ3)	AA
071	NBLTH0068AFZZ	Belt, Drive	AE
072	NBLTK0145AFZZ	Belt, Auto Stop	AC
073	NBRGC0065AFZZ	Bearing, Capstan	AP
074	NDAIR0123AFSA	Turntable, Take-up	AF
075	NDAIR0133AFSA	Turntable, Supply	AE
076	NFLYC0077AFZZ	Flywheel	AT
077	NIDR-0021AGZZ	Idler, Take-up	AC
078	NIDR-0058AFZZ	Idler, Fast Forward/Rewind	AK
079	NPLYN0002AFZZ	Pulley, Reel Motor	AG
080	NPLYR0059AFZZ	Pulley, Auto Stop	AE
081	NPLYR0066AFZZ	Pulley, Take-up	AC
082	NROLY0027AFZZ	Pinch Roller Assembly	AK
083	PCUSG0097AF00	Cushion Rubber, Sub Chassis	AB
084	PGIDM0060AFZZ	Guide, Fast Forward/Rewind Idler	AB
085	PCOVU8123AFZZ	Cover, Lamp	AC
088	RHEDA0061AFZZ	Head, Erase	AH
089	RHEDH0079AFZZ	Head, Record/Playback	BA
090	RMOTP0056AFZZ	Motor, Reel	AY
091	RMOTP0057AFZZ	Motor, Capstan	BA
092	LANGF0077AFZZ	Bracket, Drive Belt Guide	

MISCELLANEOUS

REF. NO.	PART NO.	DESCRIPTION	CODE
101	GCAB-3085AFSA	Cabinet	AW
102	GCOVA1141AFSA	Window, Control Display	AM
103	GCOVA1162AFSA	Window, Cassette Compartment Door	AN
104	GCOVA1174AFSA	Window, OPTO Peak Level Display	AM
105	GDORF3060AFSA	Cassette Compartment Door	AH
106	GITAU0011AFZZ	Cover, Bottom	AQ
107	GLEGP0065AF00	Outer Leg	AB
108	GLEGP0066AF00	Inner Leg	AA
109	GWAKP1079AFSA	Fram, Meter (RT-7100H)	AN
	GWAKP1079AFSB	Fram, Meter (RT-7100HB)	AN
110	HDECA0345AFSA	Decoration Plate, Cassette Compartment Door Window (RT-7100H)	AL
	HDECA0345AFSB	Decoration Plate, Cassette Compartment Door Window (RT-7100HB)	AL
111	HDECB0110AFSB	Badge, APMS (RT-7100H)	AD
	HDECB0110AFSB	Badge, APMS (RT-7100HB)	AE
112	HPNLC3389AFSA	Front Panel (RT-7100H)	BA
	HPNLC3389AFSB	Front Panel (RT-7100HB)	BC
113	JKNBK0186AFSA	Outer Knob, Microphone/Line. DIN Recording Level Control (RT-7100H)	AH
	JKNBK0186AFSB	Outer Knob, Microphone/Line. DIN Recording Level Control (RT-7100HB)	AK
114	JKNBM0297AFSA	Button, Power Switch (RT-7100H)	AD
	JKNBM0297AFSB	Button, Power Switch (RT-7100HB)	AD
115	JKNBM0298AFSA	Button, Dolby NR/FM Multiplex/Tape Selector/Peak Hold/Peak Hold Auto Reset/Beep Tone (RT-7100H)	AD
	JKNBM0298AFSB	Button, Dolby NR/FM Multiplex/Tape Selector/Peak Hold/Peak Hold Auto Reset/Beep Tone (RT-7100HB)	AD
116	JKNBM0312AFSA	Button, Eject (RT-7100H)	AH
	JKNBM0312AFSB	Button, Eject (RT-7100HB)	AH
117	JKNBM0316AFSA	Knob, Timer Standby (RT-7100H)	AD
	JKNBM0316AFSB	Knob, Timer Standby (RT-7100HB)	AD
118	JKNBN0405AFSA	Knob, Output Level Control (RT-7100H)	AH
	JKNBN0405AFSB	Knob, Output Level Control (RT-7100HB)	AH
119	JKNBN0418AFSA	Inner Knob, Microphone/Line. DIN Recording Level Control (RT-7100H)	AH
	JKNBN0418AFSB	Inner Knob, Microphone/Line. Recording Level Control (RT-7100HB)	AK
120	JKNBZ0164AFSA	Button, Rewind/Fast-forward/Pause/Auto Spacing (RT-7100H)	AC
	JKNBZ0164AFSB	Button,Rewind/Fast-forward/Pause/Auto Spacing (RT-7100HB)	AD
121	JKNBZ0165AFSA	Button, Stop/APSS Reverse/APSS Forward/Play/Record (RT-7100H)	AC
	JKNBZ0165AFSB	Button, Stop/APSS Reverse/APSS Forward/Play/Record (RT-7100HB)	AD
122	KCPUZ0001AFSA	Microprocessor Controlled Unit (RT-7100H)	BY
	KCPUZ0001AFSB	Microprocessor Controlled Unit (RT-7100HB)	BY
124	LANGH0123AFZZ	Bracket, P.W. Board Retaining	AG
125	LANGH0124AFZZ	Bracket, Right Side (Rear)	AD
126	LANGH0125AFZZ	Bracket, Left Side (Rear)	AD
127	LANGH0126AFZZ	Bracket, Left & Right Side (Upper Part)	AC
128	LANGH0129AFZZ	Bracket, Strengthen	AB
129	LANGJ0080AFZZ	Bracket, Left & Right Side (Lower Part)	AF
130	LANGJ0081AFZZ	Bracket, Left Side (Front)	AF
131	LANGJ0082AFZZ	Bracket, Right Side (Front)	AF
132	LANGJ0083AFZZ	Bracket, Mechanism Retaining (Upper Part)	AG
133	LANGK0215AFZZ	Bracket, Mechanism Retaining (Lower Part)	AK
134	LANGQ0679AFZZ	Bracket, Timer Standby Switch	AC
135	LANGR0474AFZZ	Bracket, Power Transformer	AG
136	LANGR0475AFZZ	Bracket, Volume	AD
137	LANGT0834AFZZ	Bracket, P.W. Board Retaining	AC
138	LANGT0835AFZZ	Bracket, P.W. Board Retaining	AE
139	LANGT0836AFZZ	Bracket, OPTO Peak Level Display Meter Assembly	AD
140	LANGT0838AFZZ	Bracket, P.W. Board Retaining	AC
141	LANGT0856AFZZ	Bracket, P.W. Board Retaining	AB
142	LANGT0865AFZZ	Bracket, Rear (RT-7100H)	AR
	LANGT0880AFZZ	Bracket, Rear (RT-7100HB)	AR
143	LANGT0866AFZZ	Bracket, Switch	AE
144	LANGT0867AFZZ	Bracket, P.W. Board	AE
145	LANGT0874AFZZ	Bracket, P.W. Board	AD
146	LANGT0875AFZZ	Bracket, P.W. Board	AC

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	CODE
147	Part of RPLU-0099AFZZ	Bracket, Record/Playback Plunger Solenoid Assembly	–
148	LANGZ0070AFZZ	Cover, Mechanism Block (Left Side)	AE
149	LANGZ0071AFZZ	Cover, Mechanism Block (Right Side)	AE
150	LBOSG0059AFFW	Spacer, Logic P.W. Board Retaining	AA
⚠151	LBSHC0002AGZZ	Bushing, AC Power Cord	AB
	LBSHC0004AGZZ	Bushing, AC Power Cord	AB
	LBSHC0007AFZZ	Bushing, AC Power Cord	AB
⚠152	LBSHC0058AFZZ	Bushing, Power Transformer Leads	AC
153	LHLDF1224AFSA	Holder, Mechanism Control Buttons (RT-7100H)	AD
	LHLDF1224AFSB	Holder, Mechanism Control Buttons (RT-7100HB)	AE
154	LHLDF1227AFSA	Holder, Dolby NR/FM Multiplex/Tape Selector Switch Buttons (RT-7100H)	AD
	LHLDF1227AFSB	Holder, Dolby NR/FM Multiplex/Tape Selector Switch Buttons (RT-7100HB)	AE
155	LHLDP1061AFSA	Holder, Mechanism Control LED (RT-7100H)	AD
	LHLDP1061AFSB	Holder, Mechanism Control LED (RT-7100HB)	AE
156	LHLDP1062AFSA	Holder, Dolby NR/FM Multiplex/Tape Selector LED (RT-7100H)	AD
	LHLDP1062AFSB	Holder, Dolby NR/FM Multiplex/Tape Selector LED (RT-7100HB)	AE
157	LHLDW1068AFZZ	Wire Holder (100mm)	AA
158	LHLDW1075AFZZ	Wire Holder (60mm)	AA
159	LHLDW1080AFZZ	Wire Holder	AA
160	LHLDW1081AFZZ	Wire Holder	AA
161	LX-LZ0055AF00	Push Rivet, P.W. Board Retaining (Not Available)	–
162	LX-NZ0052AFFD	Nut, Frame Retaining	AA
163	LX-NZ0118AFFD	Nut, Mic/Phones Jack Retaining	AA
164	MLEVF0946AFZZ	Lever, Power Switch	AC
165	Part of RPLU-0099AFZZ	Lever, Record/Playback Plunger Solenoid Assembly	–
166	MLEVP0159AFZZ	Lever, Dolby NR/FM Multiplex/Tape Selector	AC
167	MSPRT0611AFFJ	Spring, Record/Playback Switch Interlocking	AB
168	PFILW0009AFSA	Filter, OPTO Peak Level Display	AK
169	PFLT-0330AF00	Felt, Cabinet	AA
170	PGUMM0139AF00	Felt, Outer Leg	AA
171	PGUMS0136AF00	Rubber, Mechanism Control Switch Shild	AA
172	PRDAR0101AFFW	Heat Sink, Small	AB
173	PRDAR0202AFFW	Heat Sink, Large	AN
174	PSHEZ0080AFZZ	Fiber, 12mm x 80mm x 0.5mm	AC
175	PSLDC3082AFZZ	Shild, Mechanism Control Switch	AE
176	PSLDM3160AFZZ	Shild, Power Transformer	AD
177	PSLDM3161AFZZ	Shild, Power Transformer	AD
178	PSPAN0051FFZZ	Washer, Transistor Retaining	AA
179	PSPAS0080AFSA	Spacer, Power Switch (RT-7100H)	AB
	PSPAS0080AFSB	Spacer, Power Switch (RT-7100HB)	AB
180	PSPAS0084AFSA	Spacer, Beep Tone Switch (RT-7100H)	AA

REF. NO.	PART NO.	DESCRIPTION	CODE
	PSPAS0084AFSB	Spacer, Beep Tone Switch (RT-7100HB)	AA
181	PSPAS0092AFSA	Spacer, Timer Standby Switch (RT-7100H)	AB
	PSPAS0092AFSB	Spacer, Timer Standby Switch (RT-7100HB)	AB
182	PSPAZ9002AGZZ	Spacer (Mica), Transistor (Q501–503, Q505)	AA
⚠183	QACCB0052AF09	AC Power Cord	AH
	QACCL0001AFZZ	AC Power Cord	AL
	QACCV0001AGZZ	AC Power Cord	AL
	QACCZ0002TA0F	AC Power Cord	AG
	QACCZ0053AF00	AC Power Cord	AK
CNPTR1	QCNCM305EAFZZ	Plug, 5 Pin	AC
CNPTR2	QCNCM304CAFZZ	Plug, 3 Pin	AC
CNP1	QCNCM171BAFZZ	Plug, 2 Pin	AB
CNP3	QCNCM176GAFZZ	Plug, 7 Pin	AC
CNP5	QCNCM176GAFZZ	Plug, 7 Pin	AC
CNP6	QCNCM317NAFZZ	Plug, 13 Pin	AD
CNP7	QCNCM178JAFZZ	Plug, 9 Pin	AC
CNP8	QCNCM171BAFZZ	Plug, 2 Pin	AB
CNP13	QCNCM172CAFZZ	Plug, 3 Pin	AB
CNP32	QCNCM171BAFZZ	Plug, 2 Pin	AB
CNP34	QCNCM100DAFZZ	Plug, 4 Pin	AB
CNP35	QCNCM172CAFZZ	Plug, 3 Pin	AB
CNP38	QCNCM178JAFZZ	Plug, 9 Pin	AC
CNP39	QCNCM136CAFZZ	Plug, 3 Pin	AB
CNP40	QCNCM290TAFZZ	Plug, 18 Pin	AE
CNP46	QCNCM171BAFZZ	Plug, 2 Pin	AB
CNP47	QCNCM171BAFZZ	Plug, 2 Pin	AB
CNP101	QCNCM102FAFZZ	Plug, 6 Pin	AB
CNP102	QCNCM316BAFZZ	Plug, 2 Pin	AB
CNP103	QCNCM175FAFZZ	Plug, 6 Pin	AC
CNS1	QCNCW142BAFZZ	Socket, 2 Pin Without Tip & Lead	AA
CNS3	QCNCW147GAFZZ	Socket, 7 Pin Without Tip & Lead	AB
CNS5	QCNCW147GAFZZ	Socket, 7 Pin Without Tip & Lead	AB
CNS6	QCNW-0555AFZZ	Socket, 13 Pin With Tip & Leads	AH
CNS7	QCNCW149JAFZZ	Socket, 9 Pin Without Tip & Lead	AB
CNS8	QCNCW142BAFZZ	Socket, 2 Pin Without Tip & Lead	AA
CNS10	QCNCW0902AGZZ	Socket, 9 Pin Without Tip & Lead	AB
CNS13	QCNCW143CAFZZ	Socket, 3 Pin Without Tip & Lead	AA
CNS32	QCNCW142BAFZZ	Socket, 2 Pin Without Tip & Lead	AA
CNS34	QCNW-0538AFZZ	Socket, 4 Pin With Tip & Leads	AK
CNS35	QCNCW143CAFZZ	Socket, 3 Pin Without Tip & Lead	AA
CNS38	QCNCW149JAFZZ	Socket, 9 Pin Without Tip & Lead	AB
CNS39	QCNCW107CAFZZ	Socket, 3 Pin Without Tip & Lead	AB
CNS40	QCNCW187TAFZZ	Socket, 18 Pin Without Tip & Lead	AC
CNS43	QCNCW182NAFZZ	Socket, 13 Pin Without Tip & Lead	AC
CNS44	QCNCW187TAFZZ	Socket, 18 Pin Without Tip & Lead	AC

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	CODE
CNS46	QCNCW142BAFZZ	Socket, 2 Pin Without Tip & Lead	AA
CNS47	QCNCW142BAFZZ	Socket, 2 Pin Without Tip & Lead	AA
CNS101	QCNW-0557AFZZ	Socket, 6 Pin With Tip & Leads	AH
CNS102	QCNW-0556AFZZ	Socket, 2 Pin With Tip & Shild Lead	AH
CNS103	QCNW-0575AFZZ	Socket, 6 Pin With Tip & Leads	AK
	QCNW-0127AFZZ	Audio Cables with RCA-type Pin Plugs	AL
⚠F502, ⚠F503	QFS-C631CAGNI	Fuse, T630mA	AE
⚠F504, ⚠F505	QFS-C122CAGNI	Fuse, T1.25A	AE
184	QFSHD1001AGZZ	Fuse Holder	AA
185	QHWS-3001AGFN	Lug (Not Available)	–
J101	QJAKE0063AFZZ	Jack, Mic. L-ch (Mono)	AF
J102	QJAKE0063AFZZ	Jack, Mic. R-ch	AF
J103	QJAKJ0075AFZZ	Headphone	AF
186	QLUGP0111CEFW	Lug Pin (13mm)	AA
187	QLUGP9053AFFW	Lug Pin (20mm)	AA
⚠SO501	QSOCE0551AFZZ	Switch, AC Voltage Selector	AG
SO502	QSOCD0276AFZZ	Socket, Timer	AE
SO101 (A–E)	QSOCZ2181AFZZ	Input/Output Terminal Assembly A, B : Line in C : REC/PB D, E : Line out	AH
SW1 (A–L)	QSW-S0228AFZZ	Switch, Record/Playback	AH
SW2 (A–D)	QSW-S0170AFZZ	Switch, DIN/Line Selector	AF
SW3 (A–C)	QSW-P0237AFZZ	Switch, Dolby NR	AR
SW4 (A–C)		Switch, FM Multiplex Filter	
SW5		Switch, Tape Selector (Normal)	
SW6 (A–H)		Switch, Tape Selector (Fe-Cr)	
SW7 (A–H)		Switch, Tape Selector (CrO_2)	
SW9,	QSW-P0221AFZZ	Switch, Peak Hold	AH
SW10		Switch, Peak Hold Auto Reset	
SW12	QSW-F0134AFZZ	Switch, Discharge on/off	AE
⚠SW14 (A, B)	QSW-P0158AFZZ	Switch, Power	AL
SW18	QSW-M0065AFZZ	Switch, Erase Protection	AG
SW19	QSW-M0065AFZZ	Switch, Cassette Loading	AG
SW20	QSW-M0065AFZZ	Switch, Cassette Detector	AG
SW21	Not Available	Relay, Power State Switch (Part of RLY1)	–
SW22 (A, B)	QSW-B0117AFZZ	Switch, Timer Standby	AG
SW23	QSW-P0219AFZZ	Switch, Beep Tone	AE
SW24	QSW-P0222AFZZ	Switch, Stop	AQ
SW25		Switch, Reverse APSS	
SW26		Switch, Forward APSS	
SW27		Switch, Rewind	
SW28		Switch, Play	
SW29		Switch, Fast-forward	
SW30		Switch, Record	
SW31		Switch, Pause	
SW32		Switch, Auto Spacing	
188	QTANN0256AFZZ	Terminal, AC Power Cord Connection	AF
189	QTIPZ0002SGZZ	Tip, Socket	AA
190	QTIPZ0058AFZZ	Tip, Socket	AA
191	QTIPZ0062AFZZ	Tip, P.W. Board	AA
192	QTIPZ0073AFZZ	Tip, Socket	AA
BZ1	RALMB0052AFZZ	Piezo Buzzer, Beep Tone	AG
PL1, PL2	RLMPM0001PAZZ	Lamp, Control Unit LCD Illumination	AD
PL3, PL4	RLMPM0108AFZZ	Lamp, Cassette Tape Illumination	AE
ME901	RMTRL0194AFZZ	OPTO Peak Level Display Assembly	BP
SOL401	RPLU-0093AFZZ	Plunger Solenoid, Capstan	AW
SOL402	RPLU-0094AFZZ	Plunger Solenoid, Reel	AV
SOL403	Part of RPLU-0099AFZZ	Plunger Solenoid, Record	–
	RPLU-0099AFZZ	Record Plunger Solenoid Assembly	AV
RLY1	RRLYZ0069AFZZ	Relay, Power State Switch (SW21)	AM
193	PCOVW7110AFZZ	Cover, Transformer Bracket	
194	PCUSU0242AFZZ	Cushion	
195	PGUMS0138AF00	Cushion	
196	PCOVW9108AFZZ	Cover, Tip	
	SPAKA0575AFZZ	Packing Add	AK
	SPAKC1326AFZZ	Packing Case (RT-7100H)	AV
	SPAKC1354AFZZ	Packing Case (RT-7100HB)	AV
	SSAKA0021AGZZ	Sack, Unit	AD
	SSAKA0024AFZZ	Sack, Instruction Manual etc.	AA
	*TCADN0050AFZZ	Registration Cord (for U.K.)	AA
	*TCAUH0056AGZZ	Caution, AC Power Cord (for U.K.)	
	*TCAUZ0039AFZZ	Caution Sack (for U.K.)	
	*TGANE1117AFZZ	Garanty Card (for U.K.)	
	TGANE1119AFZZ	Garanty Card (for Australia)	
	TGANG1039AFZZ	Garanty Card (for West Germany)	
	TINSZ0173AFZZ	Instruction Manual	
	*TLABJ0006AFZZ	Label, Made in Japan (for U.K.)	
	*TLABS0054AFZZ	Label, BEAB (for U.K.)	
	TLABS0080AFZZ	Label, SEMKO	
	TLABS0081AFZZ	Label, NEMKO	
	TLABS0082AFZZ	Label, DEMKO	
	TLABS0083AFZZ	Label, SEV	
	TLABS0089AFZZ	Label, F	
	*TLSTS0001ZZR0	Service Station List (for U.K.)	
	TMAPC0586AFZZ	Schematic Diagram	
	TTAGH0096AFZZ	Tag, English, French, German, Swedish, Spanish	AC

NOTE

Replacement Parts with asterisk (*) mark are used for U.K. only.

ASSEMBLY PARTS

REF. NO.	PART NO.	DESCRIPTION	CODE
122	KCPUZ0001AFSA	Microprocessor-Controlled Unit (RT-7100H)	BZ
	KCPUZ0001AFSB	Microprocessor-Controlled Unit (RT-7100HB)	BZ
CNP43	QCNCM237NAFZZ	Plug, 13 Pin	
CNP44	QCNCM290TAFZZ	Plug, 18 Pin	AE

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	CODE
122-1	JKNBZ0164AFSA	Button, Switch (RT-7100H)	AC
	JKNBZ0164AFSB	Button, Switch (RT-7100HB)	AD
122-2	S-10P01	Frame (RT-7100H)	
	S-10P02	Frame (RT-7100HB)	
122-3	S-10P04	Filter, LCD Front	
122-4	S-10P05	LCD (Liquid Crystal Display)	
122-5	S-10P06	Indication Plate	
122-6	S-10P07	Cushion	
122-7	S-10P08	Conductive Rubber, LCD Connection	
122-8	S-10P09	P.W. Board Assembly (Without Lamp)	
122-9	S-10P10	Spacer	
122-10	S-10P11	Holder, LCD	
122-11	S-10P12	Filter, LCD Illumination	
122-12	S-10P13	Shield Plate, Knob	
122-13	S-10P14	Shield Plate, Unit	
122-14	S-10P15	Holder, Lamp	
122-15	S-10P16	Cover, Lamp	
122-16	S-10P17	Conductive Rubber, Switch	

PWB ASSEMBLY (Not Replacement Item)

REF. NO.	PART NO.	DESCRIPTION	CODE
	DUNTJ0049AF02	Power Supply P.W. Board Assembly	BK
	DUNTR0033AF02	Main P.W. Board Assembly	BX
	DUNTX0007AF04	Mechanism Control P.W. Board Assembly	BF
	DUNTZ0009AF04	Logic P.W. Board Assembly	BM

SHARP OPTONICA

SERVICE MANUAL

RT-7100H
RT-7100HB

<PART II>

Refer to the previous issue
"SERVICE MANUAL <PART I>

SHAR-03497

ELECTRONIC TAPE PROCESSOR

MODEL
RT-7100H
RT-7100HB

PHOTO: RT-7100H

APMS
Auto Programmable Music Selector

DOLBY SYSTEM ®

Noise reduction system manufactured under license from Dolby Laboratories.
"Dolby" and the double-D symbol are trademarks of Dolby Laboratories.

In the interests of user-safety the set should be restored to its original condition and only parts identical to those specified be used.

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3497

SHARP CORPORATION OSAKA, JAPAN

SPECIFICATIONS

Electronic Tape Processor RT-7100H/HB

Power source: AC 110/220/240 V, 50/60 Hz
Power consumption: 40 W
Semi-conductors: 1 LSI (Large Scale Integrated Circuit)
5 ICs (Integrated Circuit)
103 Transistors
107 Diodes
13 LEDs (Light Emitting Diode)
Dimensions: width: 430 mm (16-15/16″)
height: 144 mm (5-11/16″)
depth: 371 mm (14-5/8″)
Weight: 11.5 kg (25.4 lbs.)
Wow and flutter: 0.15% (DIN 45 500)
Frequency response: Normal tape: 20 Hz to 15,000 Hz (DIN 45 500)
Fe-Cr tape: 20 Hz to 18,000 Hz (DIN 45 500)
MAXELL UDXLII tape: 20 Hz to 17,000 Hz (DIN 45 500)

S/N ratio: Dolby NR off: 57 dB
Dolby NR on: 67 dB (over 5 kHz)
Input sensitivity and input impedance:
Microphone: 0.2 mV/6.8K ohms
Line: 63 mV/50K ohms
Record/playback socket: 0.1 mV/K ohms
Output level and loaded impedance:
Headphones: 125 mV ("0" dB) 8 ohms
Line: 1000 mV ("0" dB) 50K ohms
Record/playback socket: 1000 mV ("0" dB) 50K ohms

* Specifications are subject to change without prior notice.

MAINS VOLTAGE SELECTION

Check the preset AC mains voltage before plugging the AC mains supply lead into an AC mains outlet. the setting is different from that of your local mains supply voltage, the voltage selector must be re-set as follows.
Rotate the voltage selector by using a screwdriver so that your local voltage number can be seen in the window.

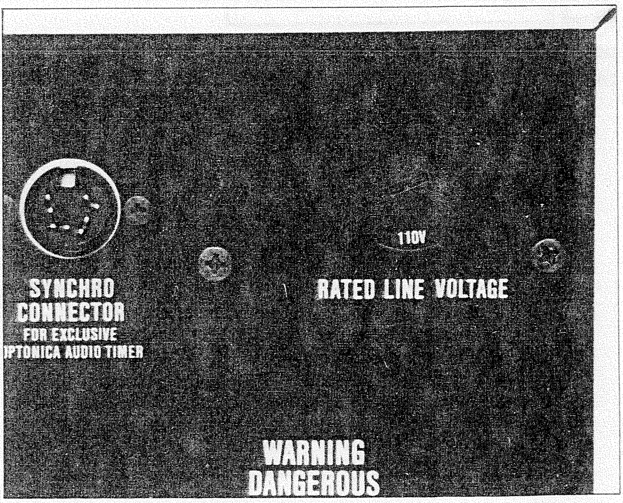


Figure 2–1

DIAGRAMS AND EXPLANATION OF FEATURES

<Electronic tape Processor RT-7100H/HB>

∗ Front Panel

① Power switch
② Timer standby switch
③ Beep tone button
④ Stereo headphone jack
⑤ Current adress button
⑥ APMS button
⑦ APMS skip/check button
⑧ Counter-memory buttons 1 & 2
⑨ Direct counter-memory buttons 1 & 2
⑩ Tape-counter button
⑪ Number-input button
⑫ Input-clear button
⑬ Input-set button
⑭ Cassette compartment
⑮ Cassette eject button
⑯ Microphone recording-level control
⑰ Fluorescent display level meter
⑱ Line/DIN recording level control
⑲ Output level control
⑳ Peak-hold on/off switch
㉑ Peak-hold auto-reset mode switch
㉒ Microphone jacks
㉓ Auto-play button
㉔ Auto-repeat button
㉕ Auto-cue button
㉖ Stop button
㉗ APSS reverse button
㉘ APSS forward button
㉙ Rewind button
㉚ Play button
㉛ Fast-forward button
㉜ Record button
㉝ Pause button
㉞ Auto-spacing button
㉟ Dolby N.R. switch
㊱ FM multiplex filter switch
㊲ Tape selector

∗ Rear-Panel

㊳ Line-input terminals
㊴ DIN recording/playback terminal
(5-pin 180°)
㊵ Line-output terminals
㊶ Line/rec/pb-input selector
㊷ Optonica AD-200T (H, B, S or D)
optional timer terminal
㊸ AC voltage selector
㊹ AC power cord

∗ LCD Indication

㊺ APMS operation indicator
㊻ Counter-memory operation indicator
㊼ Programming indicator
㊽ Current address indicator
㊾ Auto-play operation indicator
㊿ Auto-repeat operation indicator
(51) Auto-cueing operation indicator
(52) Tape direction indicator
(53) Next address indicator
(54) Current selection number mode indicator
(55) APMS memory-entry indicator
(56) APMS mode indicator
(57) Counter-memory 1 memory-entry indicator
(58) Counter-memory 1 mode indicator
(59) Counter-memory 2 memory-entry indicator
(60) Counter-memory 2 mode indicator
(61) Current tape-counter number mode indicator

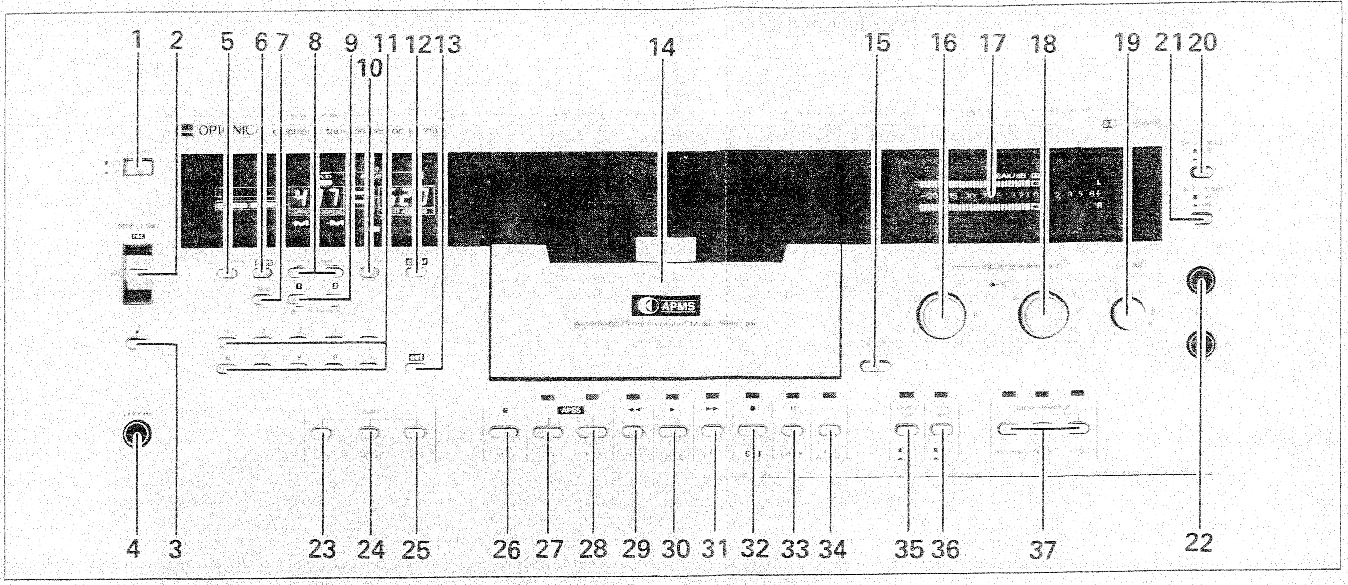

1 2 5 6 7 8 9 11 12 13
10
14
15 16 17 18 19 21 20
APMS
4 3 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 22

Figure 4–1 (PHOTO : RT-7100H)

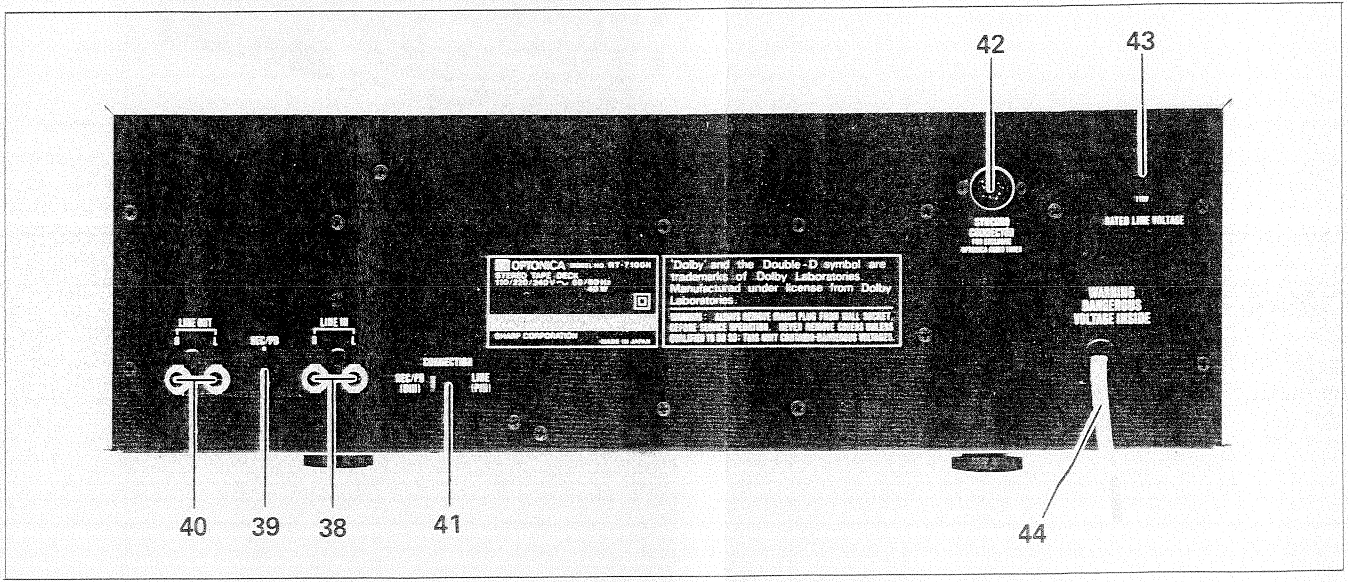

42 43
40 39 38 41 44

Figure 4–2 (PHOTO : RT-7100H)

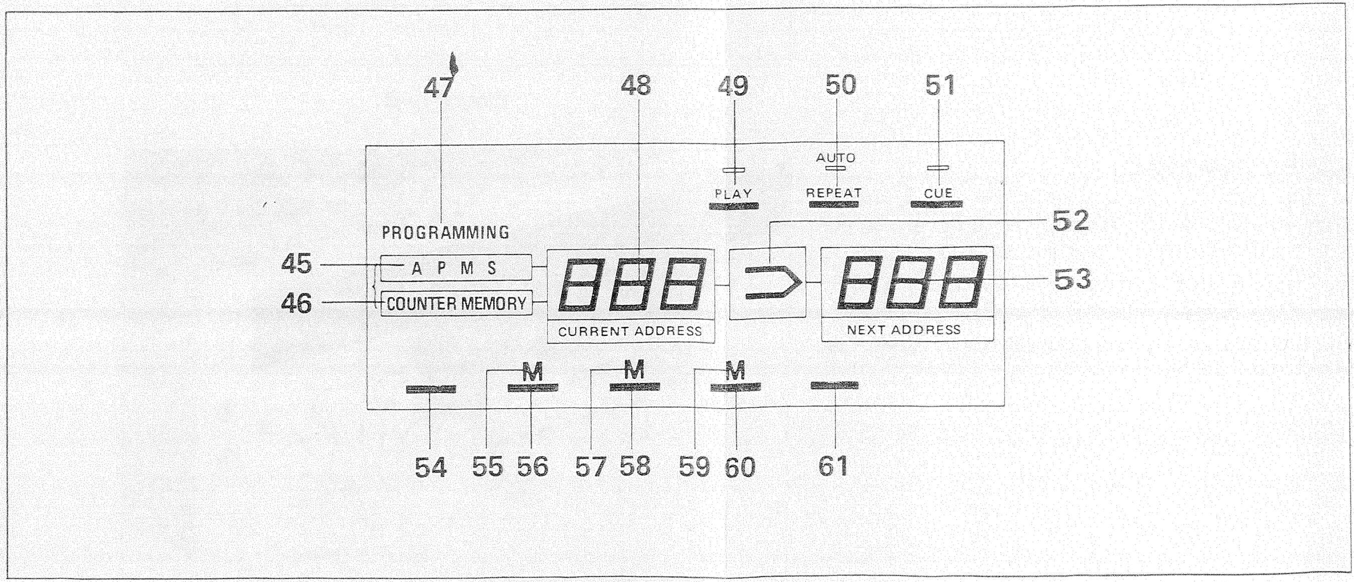

47 48 49 50 51
AUTO
PLAY
REPEAT
CUE
PROGRAMMING
52
45
A P M S
46
COUNTER MEMORY
CURRENT ADDRESS
NEXT ADDRESS
53
M
M
M
54 55 56 57 58 59 60 61

Figure 4–3

DISASSEMBLY

Notes:

When servicing the RT-7100H/HB, take into account the following for your safety, as well as keeping its own performance as best it could be.

1. When disassembling the unit be sure to withdraw the power supply cord from a wall outlet beforehand.
2. A number of nylon holders have been used to facilitate wire arrangements in the unit. If some such holders are removed for servicing the unit, be sure, thereafter, to put them back where they were.
3. Circuitry connection of the unit is made effective by means of a number of connectors. In the servicing, take care not to be wrong in their connection.
4. Keep C-MOS LSIs (in the unit) from static electricity, etc. caused in the servicing.

A CABINET REMOVAL

1. Remove the four screws retaining the cabinet (two screws each for the right and left sides) then the cabinet can be detached. (See Fig. 5–1)
2. Giving a force to the bottom of cabinet, hold it up and remove. (See Fig. 5–1)

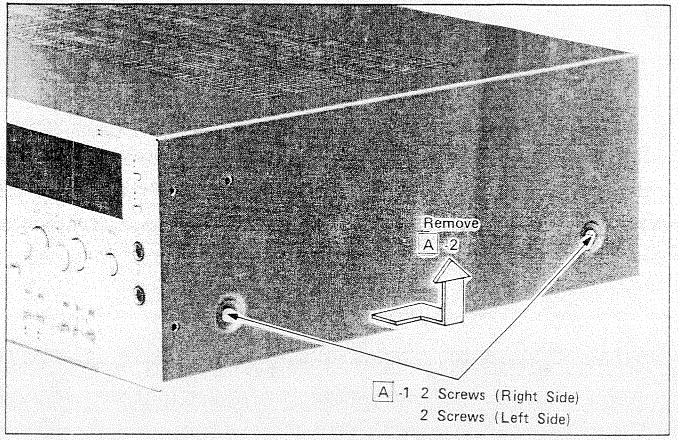


Figure 5–1

B BOTTOM COVER REMOVAL

1. Turn the unit over and remove the fifteen screws retaining the bottom cover. (See Fig. 5–2)
2. Shift the bottom cover backward and remove. (See Fig. 5–2)

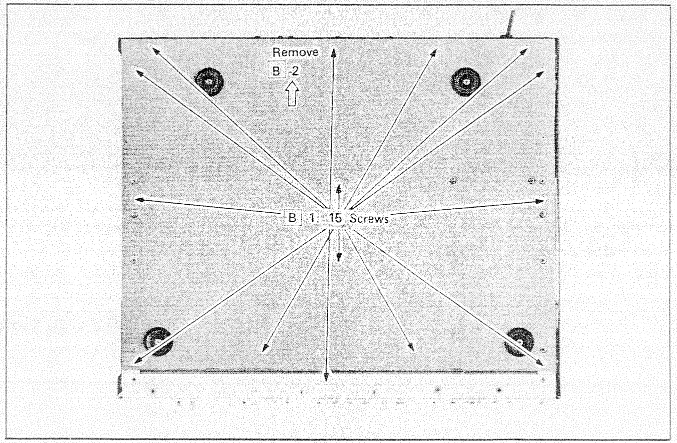


Figure 5–2

C FRONT PANEL REMOVAL

1. Remove the cabinet and bottom cover in reference to cabinet removal and bottom cover removal respectively.
2. Push the cassette eject button, and the cassette compartment door remove. (See Fig. 5–3)
3. Pull out the five knobs (mic/line/output). (See Fig. 5–3)

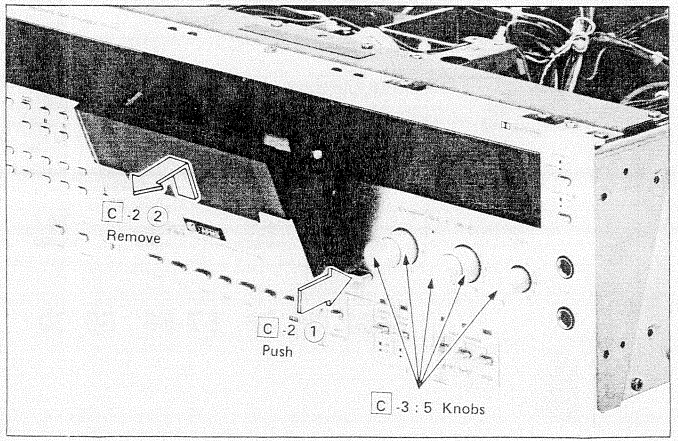


Figure 5–3

4. Remove the four screws retaining the front panel and meter frame (at its lower part). (See Fig. 6–1)
5. Remove the five screws retaining the front panel and mechanism block cover. (at its upper part). (See Fig. 6–2)
6. Pull out the four sockets (CNS38, 39, 40, 103). (See Fig. 6–2)
7. Gently pull out the front panel from the chassis. (See Fig. 6–2)

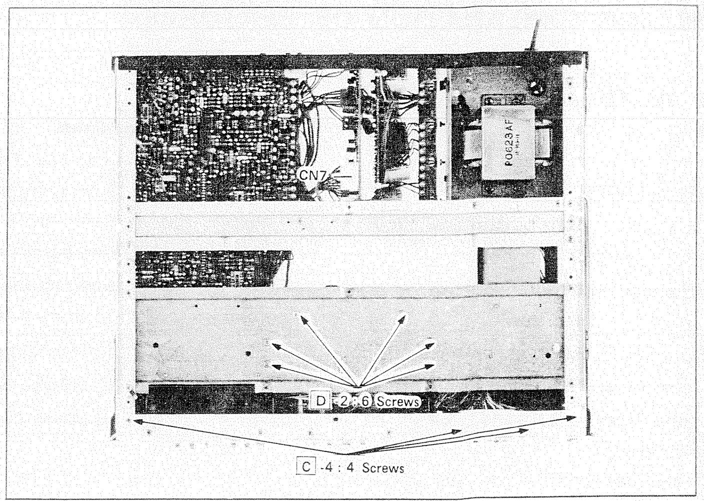


Figure 6–1

D MECHANISM BLOCK REMOVAL

1. Remove the cabinet and bottom cover in reference to cabinet removal and bottom cover removal respectively.
2. Remove the six screws retaining the mechanism block (at its lower part). (See Fig. 6–1)
3. Remove the two screws retaining the mechanism block (at its upper part). (See Fig. 6–2)
4. Pull out the five sockets (CNS6, 34, 101, 102). (See Fig. 6–2)
5. Shift the mechanism block backward and remove by holding it up. (See Fig. 6–2)

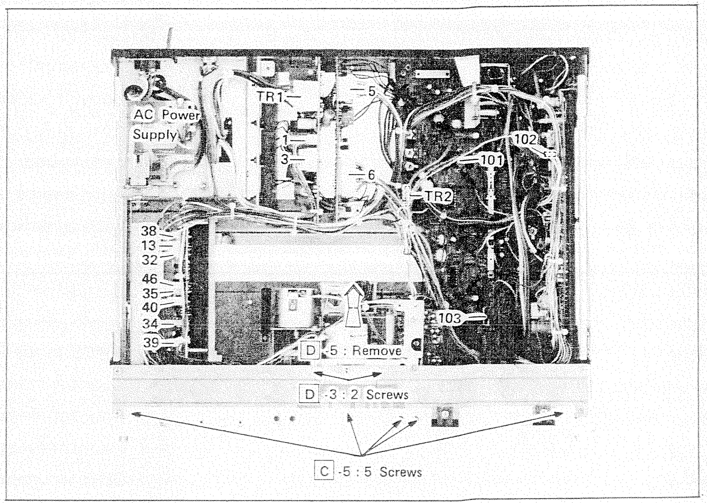


Figure 6–2

E MECHANISM CONTROL SWITCH P.W. BOARD REMOVAL

1. Remove the two screws retaining the mechanism control switch P.W. Board (See Fig. 6–3).
2. Gently take out the mechanism control switch P.W. Board from the front panel.

F TAPE SELECTOR INDICATOR P.W. BOARD REMOVAL

1. Remove the front panel in reference to front panel removal.
2. Remove the two screws retaining the tape selector indicator P.W. Board (See Fig. 6–3).
3. Gently take out the tape selector indicator P.W. Board from the front panel.

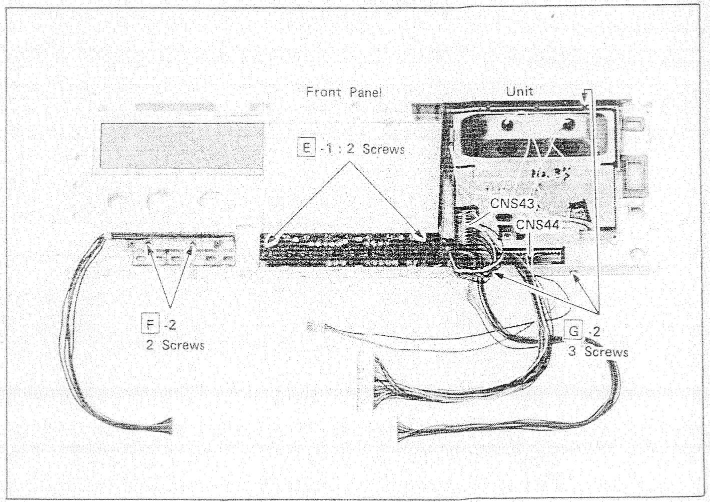


Figure 6–3

G MICROPROCESSOR-CONTROLLED UNIT REMOVAL

1. Remove the front panel in reference to front panel removal.
2. Remove the three screws retaining the microprocessor-controlled unit (See Fig. 6—3).
3. Gently take out the microprocessor-controlled unit.
4. Pull out the two sockets (CNS43, 44) (See Fig. 6—3).

* Disassembly of microprocessor-controlled unit

a) Pull out the three lamps (PL1, 2, 4) (See Fig. 7—1).
b) Remove the two screws retaining the shield plate (See Fig. 7—1)
c) Remove the four screws retaining the LCD holder and lamp holder (See Fig. 7—2).
d) Take out the LCD, indication plate and conductive rubber (See Fig. 7—3).
e) Remove the screw retaining the P.W. Board (See Fig. 7—4).
f) Take out the spacer and filter (See Fig. 7—4).
g) Take out the conductive rubber switch (See Fig. 7—5).
h) Take out the button shield plate (See Fig. 7—6).

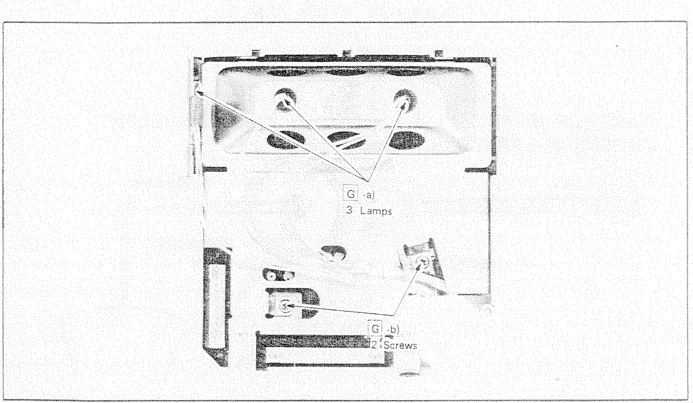

G -a)
3 Lamps
G -b)
2 Screws

Figure 7—1

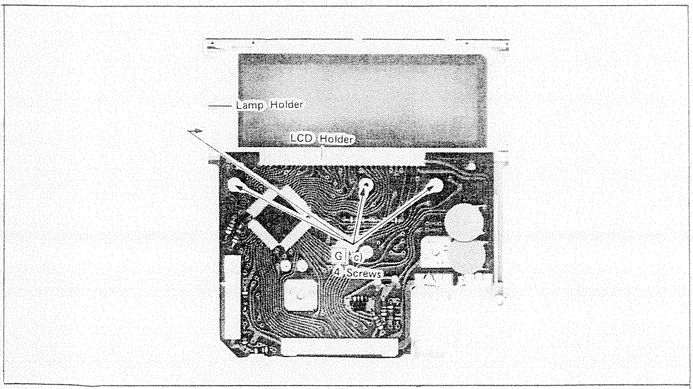

Lamp Holder
LCD Holder
G -c)
4 Screws

Figure 7—2

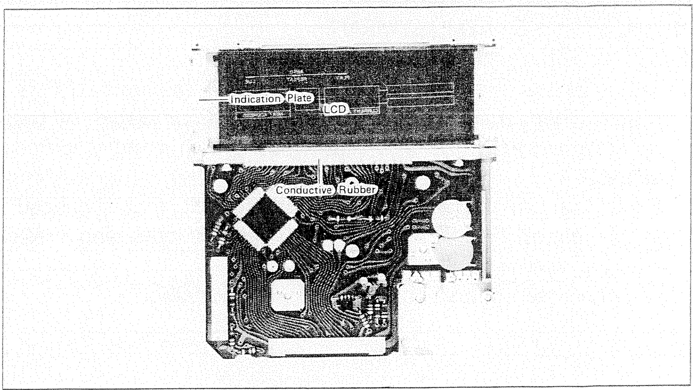

Indication Plate
LCD
Conductive Rubber

Figure 7—3

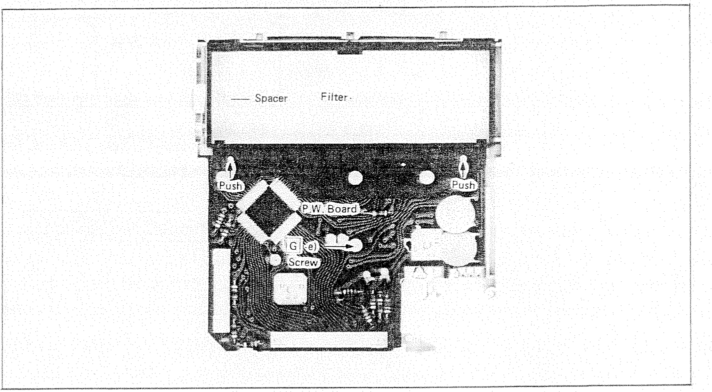

Spacer
Filter
Push
Push
P.W. Board
G -e)
Screw

Figure 7—4

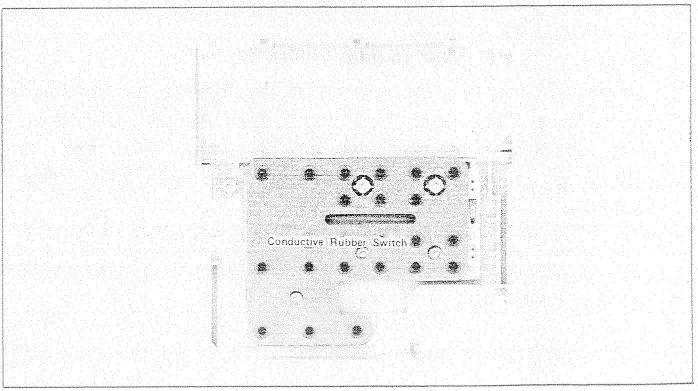

Conductive Rubber Switch

Figure 7—5

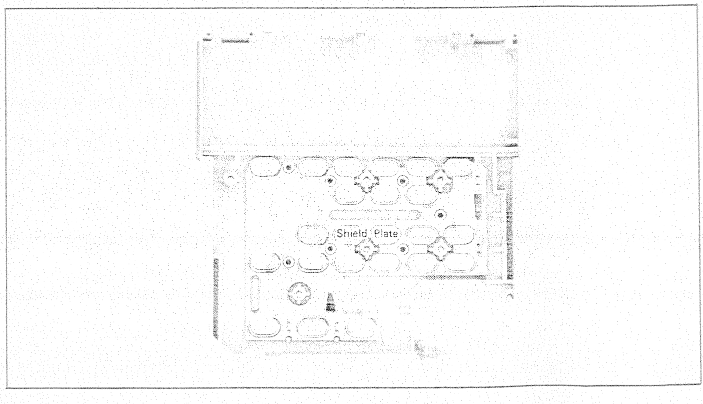

Shield Plate

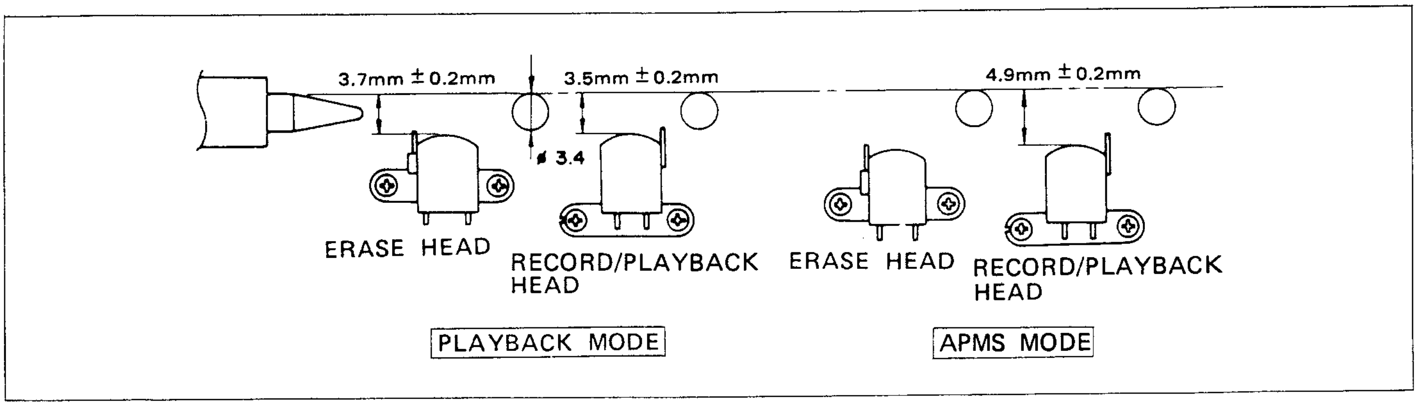
Figure 7—6

MECHANICAL ADJUSTMENT

HEAD STROKE ADJUSTMENT

(Refer to Figure 8–1)

1. Set a stroke measuring gauge and place the unit in Play mode. Then check that the head stroke for either of the record/playback head and erase head is within the specified values.
2. Place the unit in APMS mode and check that the head stroke for either of the record/playback head and erase head is within the specified values.
   If otherwise, adjust the plunger positionally.
3. Only after the above adjustments, tighten the screws of the plunger.



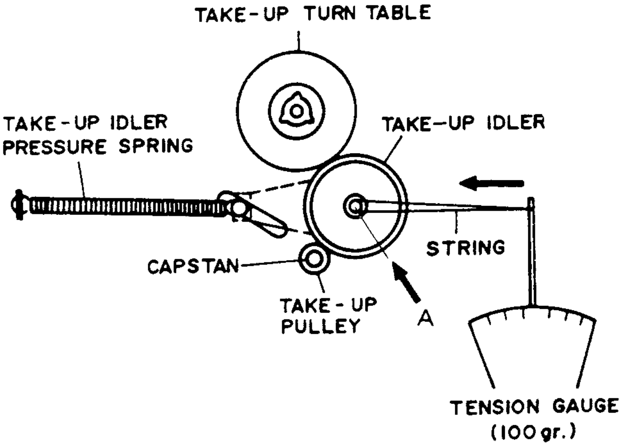
3.7mm ± 0.2mm
3.5mm ± 0.2mm
ø 3.4
4.9mm ± 0.2mm
ERASE HEAD
RECORD/PLAYBACK HEAD
ERASE HEAD
RECORD/PLAYBACK HEAD
PLAYBACK MODE
APMS MODE

Figure 8–1

■ TAKE-UP IDLER PRESSURE ADJUSTMENT

(Refer to Figure 8–2)

1. Set the unit in Play mode.
2. Pull the point A with use of a tension gauge to make the take-up idler apart from the take-up reel turntable. Then, gradually release the tension gauge and read its indicating value when the take-up reel turntable starts to rotate.
3. It is normal when the tension gauge reads 65 to 95 gr. If these values are not met, adjust the take-up idler pressure spring by bending it or replace.



TAKE-UP TURN TABLE
TAKE-UP IDLER PRESSURE SPRING
TAKE-UP IDLER
STRING
CAPSTAN
TAKE-UP PULLEY
A
TENSION GAUGE (100gr.)

Figure 8–2

CLEARANCE CHECK

(Refer to Figure 9–1)

1. Place the unit in Play mode and check that a clearance between the parts is as specified – carry out this check for all the stated parts.
2. Place the unit in APMS mode and check that a clearance between the parts is as specified – carry out this check for all the stated parts.
3. If there is found something insufficient in the step 1 or 2 above, adjust the concerned part shown in Fig. 9–1 and also check that the subchassis returning effect is normal.
4. Place the unit in Stop mode and check that the fast forward/rewind roller is in tight contact with both the supply reel and take-up reel turntables.

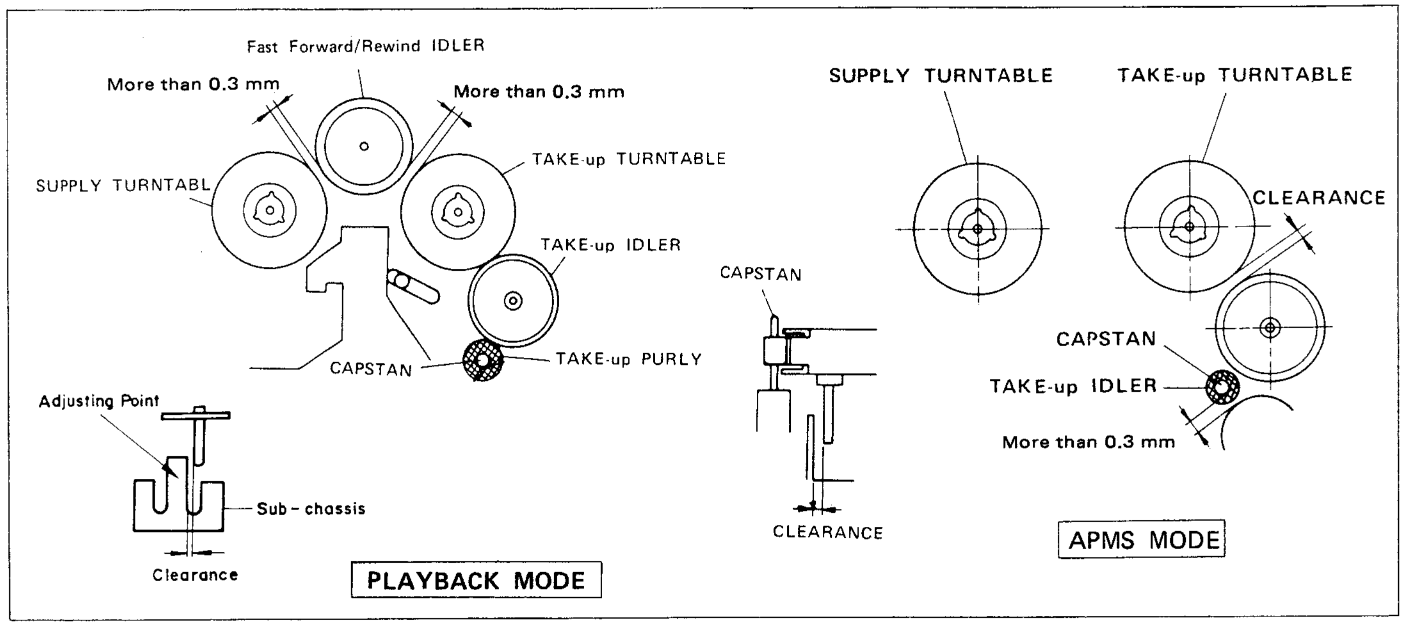

Fast Forward/Rewind IDLER
More than 0.3 mm
More than 0.3 mm
SUPPLY TURNTABL
TAKE-up TURNTABLE
TAKE-up IDLER
CAPSTAN
TAKE-up PURLY
Adjusting Point
Sub-chassis
Clearance
PLAYBACK MODE
CAPSTAN
CLEARANCE
SUPPLY TURNTABLE
TAKE-up TURNTABLE
CLEARANCE
CAPSTAN
TAKE-up IDLER
More than 0.3 mm
APMS MODE

Figure 9–1

■ TORQUE CHECK IN PLAY/FAST FORWARD/REWIND MODES

(Refer to Figure 9–2)

1. Set the torque measuring reel to the turntable (to the take-up side at Play or Fast Forward mode and to the supply side at Rewind mode).
2. Then, gradually reduce the applying force of tension gauge to have the reel rotate in the same direction as for the turntable; read the torque value here.

Mode	Torque Value
Playback	35 – 60 gr. cm
Fast Forward	90 – 145 gr. cm
Rewind	90 – 145 gr. cm

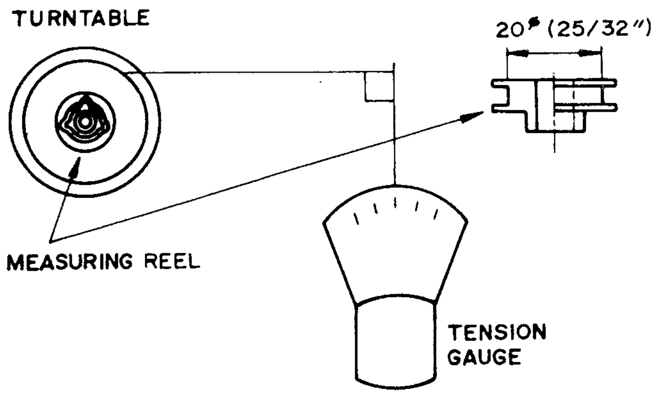

TURNTABLE
20ϕ (25/32")
MEASURING REEL
TENSION GAUGE

Figure 9–2

■ PRESSURE ROLLER PRESSURE ADJUSTMENT

(Refer to Figure 10–1)

1. Set the unit in Play mode.
2. Push the point A by using the tension gauge to make the pressure roller apart from the capstan shaft. Then, check that the tension gauge will reads 400 to 500 gr. When the pressure roller stops to rotate.
3. As a result of the check in the above step 2, if the reading is found outside the range of 400 to 500 gr.

   If these values are not met, the pressure spring of pressure roller replace.

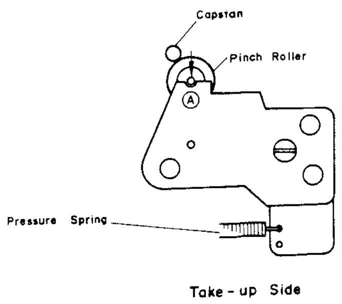

Capstan
Pinch Roller
Ⓐ
Pressure Spring
Take-up Side

Figure 10–1

■ CASSETTE TAPE PRESSURE CHECK

1. Load a cassette tape and keep the unit horizontal.
2. Apply a tension gauge to the point Ⓐ of Fig. 10–2 and push it forth in the arrowed direction until the cassette tape begins to move; there, see the tension gauge is reading 230 to 290 gr.

Note:

- No gap between the cassette tape and the cassette tape pressure lever shall exist.
- No gap between the cassette tape and the guide pin shall exist, as the result of taking the procedure in step 2.

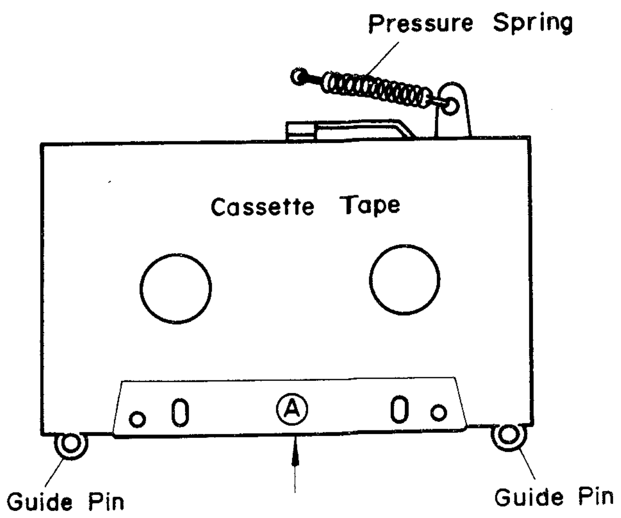

Pressure Spring
Cassette Tape
Ⓐ
Guide Pin
Guide Pin

Figure 10–2

■ SWITCH OPERATION CHECK

1. Put a cassette tape into the cassette holder and close the latter; then, check whether the cassette holder switch (SW20) and erase protection switch (SW18) both switch on normally. In the case of using a cassette holder whose erase protection tabs have been broken, check the erase protection switch (SW18) is never able to switch on.
2. Push the eject button, then see the cassette loading switch (SW19) is sure to switch on: the erase protection switch (SW18) must switch on at once.
3. If it turns out that the switch(s) operates not so well, correct it (them, by the adjusting screws).

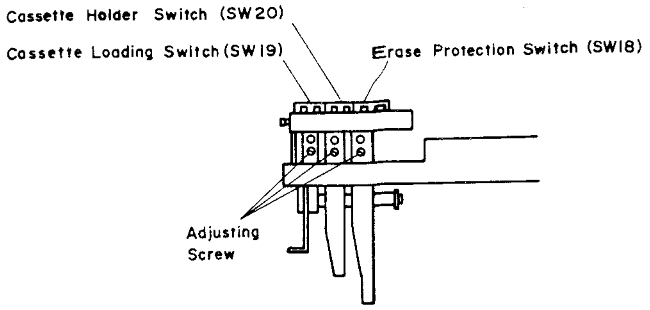

Cassette Holder Switch (SW20)
Cassette Loading Switch (SW19)
Erase Protection Switch (SW18)
Adjusting Screw

Figure 10–3

■ FLYWHEEL THRUST CLEARANCE ADJUSTMENT

(Refer to Figure 11—1)

1. Slowly turn clockwise the screw for flywheel thrust clearance until the thrust clearance becomes 0 (zero).
2. Next turn counterclockwise the screw by 1/5 to 3/5 turns from the said point. Since the screw's pitch is 0.5 mm, thrust clearance of 0.1 to 0.3 mm is now created.

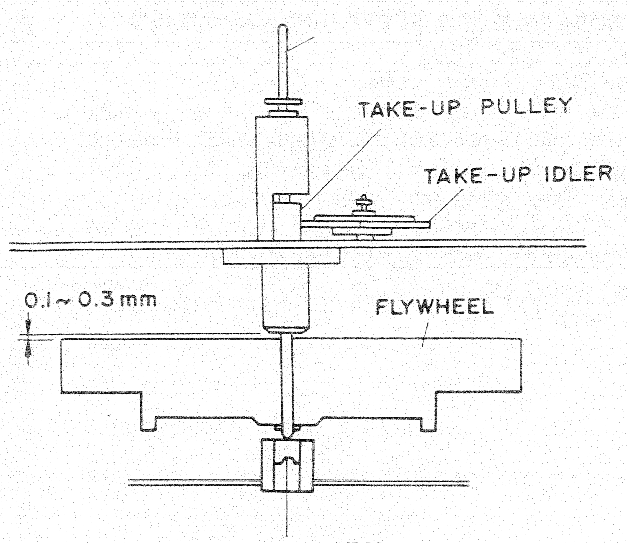

TAKE-UP PULLEY
TAKE-UP IDLER
0.1 ~ 0.3 mm
FLYWHEEL
THRUST ADJUSTER

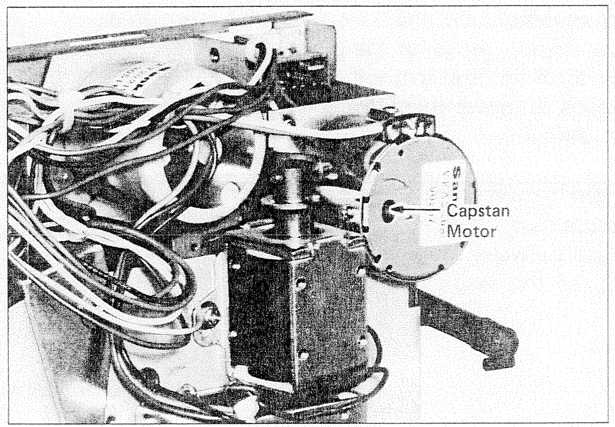
Figure 11—1

■ TAPE SPEED ADJUSTMENT

(Refer to Figure 11—2)

1. Connect a frequency counter, across a 50K ohm dummy resistor, to the line output terminal.
2. Use a test tape (MTT-111, 3 kHz), to be played back (at the midpoint but not at the running start or end point).
3. Use a bladed screwdriver to adjust, through the adjusting so that the reproduced frequency becomes 2970 to 3030 Hz.

Note:
Prior to the adjustment, check that there is no stain and no other impurities on the motor pulley, drive belt, flywheel, take-up pulley, take-up idler and take-up turntable.


Capstan Motor

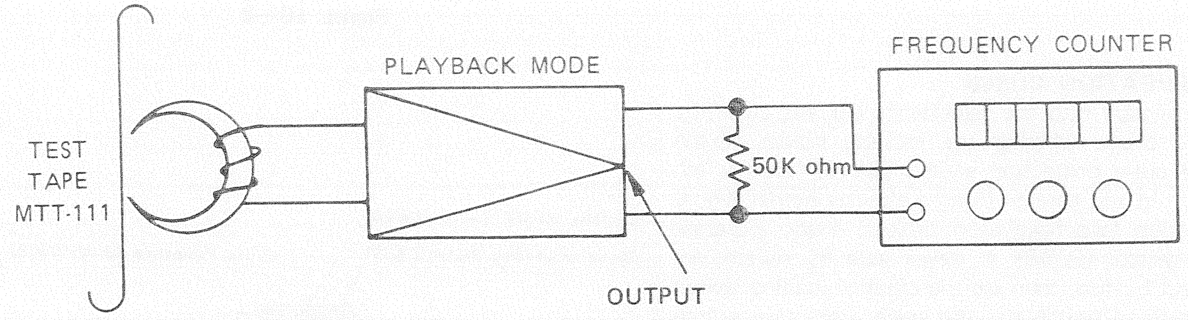
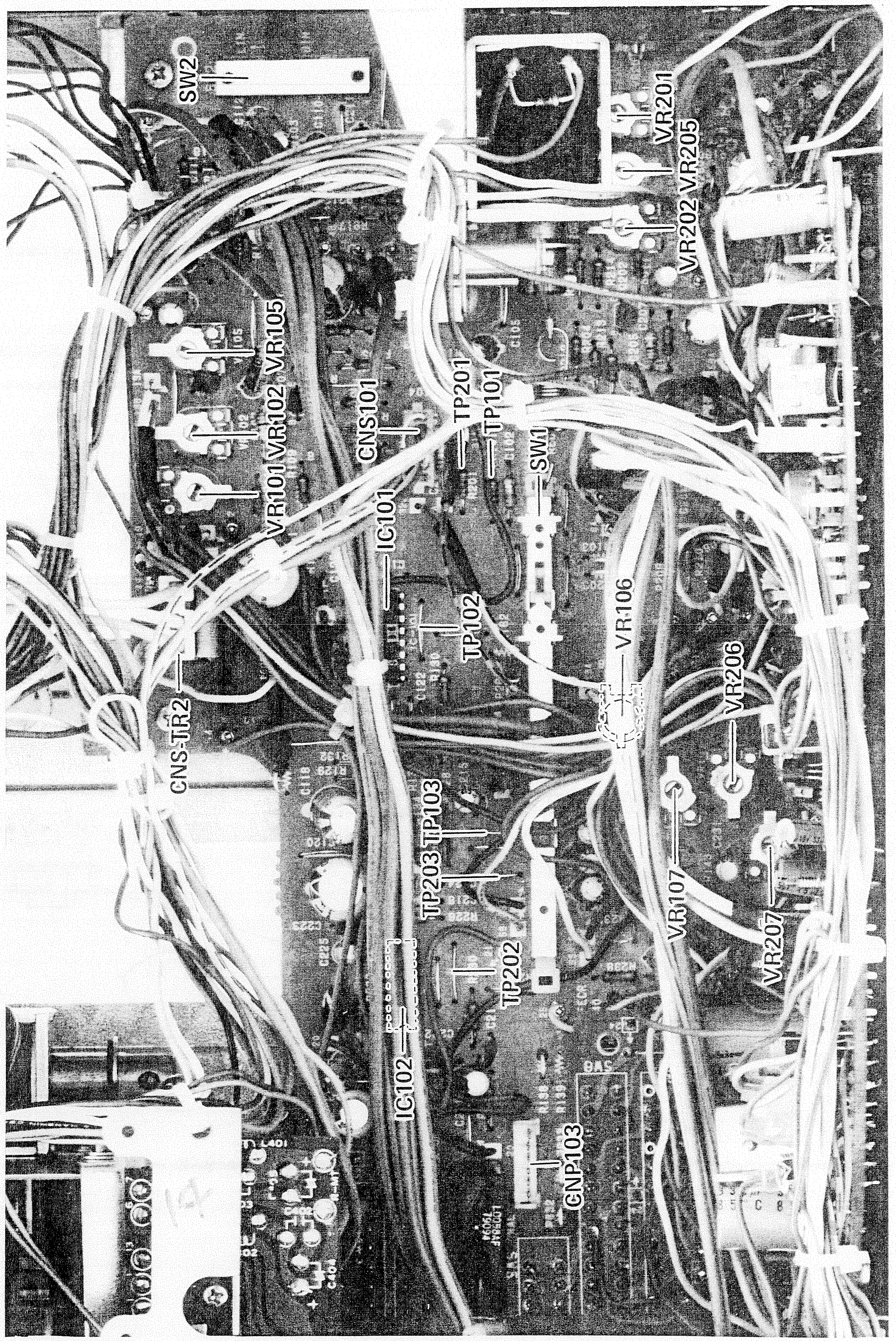
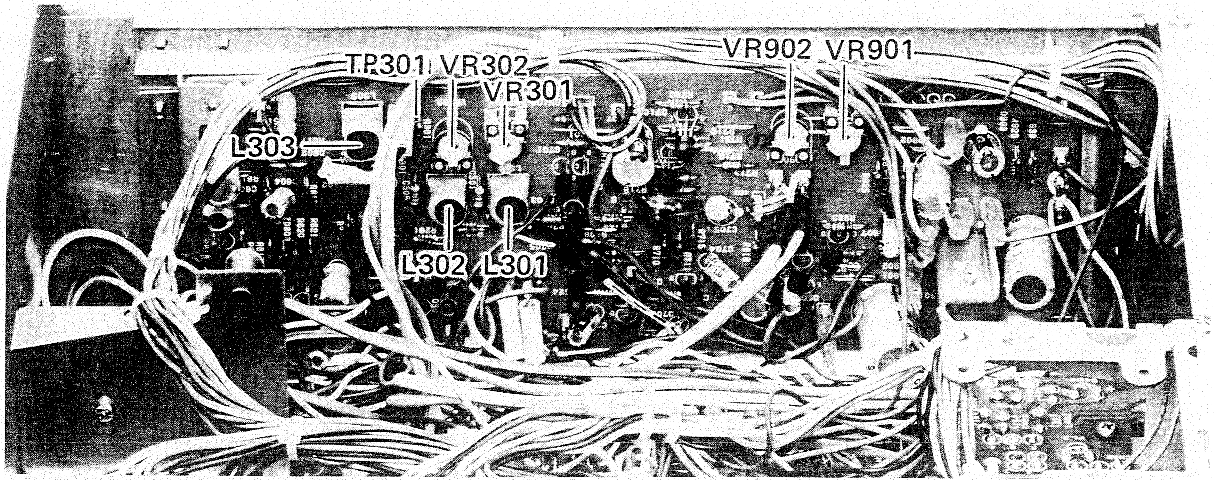

TEST TAPE MTT-111
PLAYBACK MODE
50K ohm
FREQUENCY COUNTER
OUTPUT

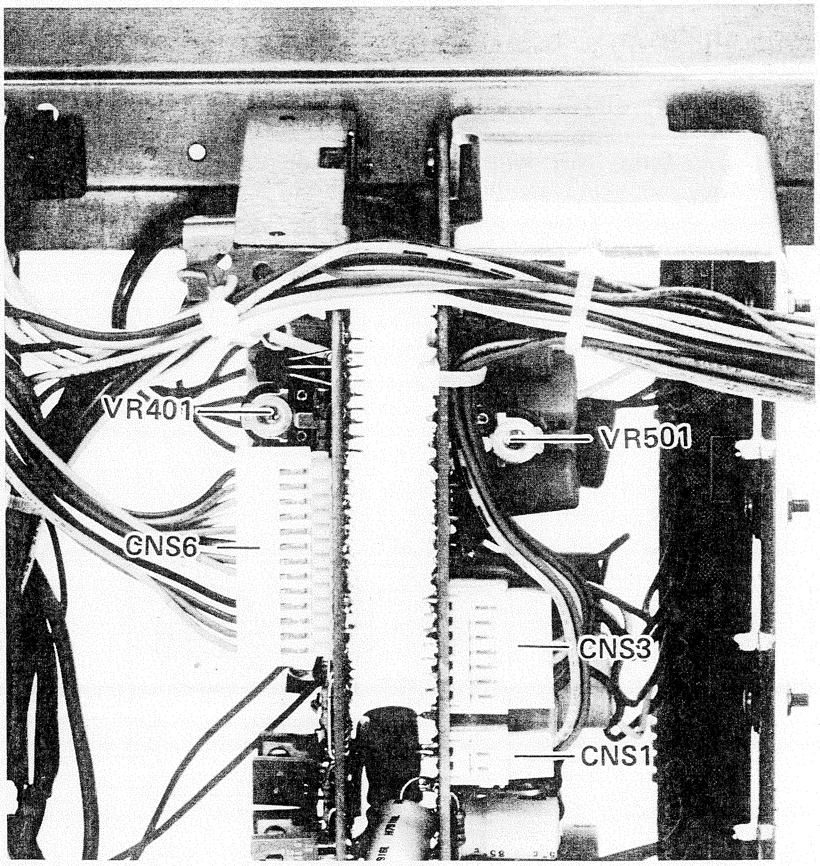
Figure 11—2

ADJUSTMENT POINT


SW2
VR201
VR205
VR202
VR105
VR102
VR101
CNS101
TP201
TP101
SW1
IC101
TP102
VR106
VR206
CNS-TR2
TP203
TP103
VR107
VR207
TP202
IC102
GNP103
14

ADJUSTMENT POINT


TP301
VR302
VR301
VR902
VR901
L303
L302
L301


VR401
VR501
CNS6
CNS3
CNS1

ELECTRICAL ADJUSTMENT

■ RECORD/PLAYBACK HEAD AZIMUTH ADJUSTMENT

(Refer to Figure 14–1)

1. Connect the V.T.V.M. to the test point (TP102, TP202).
2. Load the unit with a test tape (MTT-114, 10 kHz, 250p Wb/mm, −10 dB recorded).
3. Set the tape selector at "normal" and Dolby N.R. switch (SW3) at "off" position, respectively.
4. Set the unit in Play mode and adjust the head azimuth adjusting screw so that playback output voltage becomes maximum on the V.T.V.M.

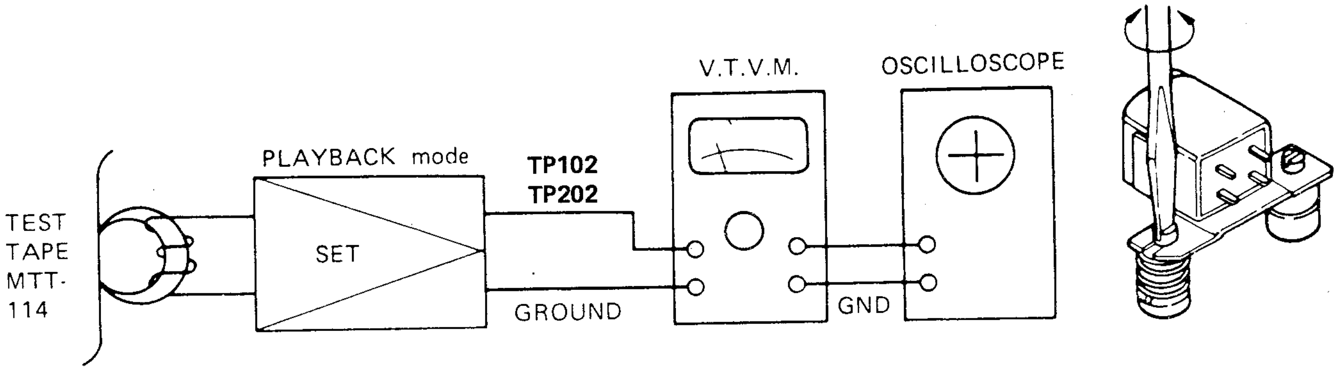

V.T.V.M.
OSCILLOSCOPE
PLAYBACK mode
TP102
TP202
TEST
TAPE
MTT-
114
SET
GROUND
GND

Figure 14–1

■ RECORD AMPLIFIER BIAS CURRENT/BIAS OSCILLATION FREQUENCY ADJUSTMENT

(Refer to Figure 14–2)

1. Connect the V.T.V.M. across the resistor (R101, R201) found on the record/playback PWB.
2. Set the tape selector at "CrO₂" and Dolby N.R. switch (SW3) at "off" position, respectively.
3. Connect the vertical input terminal of oscilloscope to the V.T.V.M. and its horizontal input terminal to the C.R. oscillator.
4. Set the unit in Record mode and adjust the bias oscillation coil (L303) so that the bias oscillation frequency becomes 85 ± 2 kHz, while watching Lissajou's figure on the oscilloscope.
5. Set the tape selector at "normal" position.
6. Adjust the bias current adjusting semi-variable resistor (VR301, VR302) so that V.T.V.M. reading becomes 40 mV.

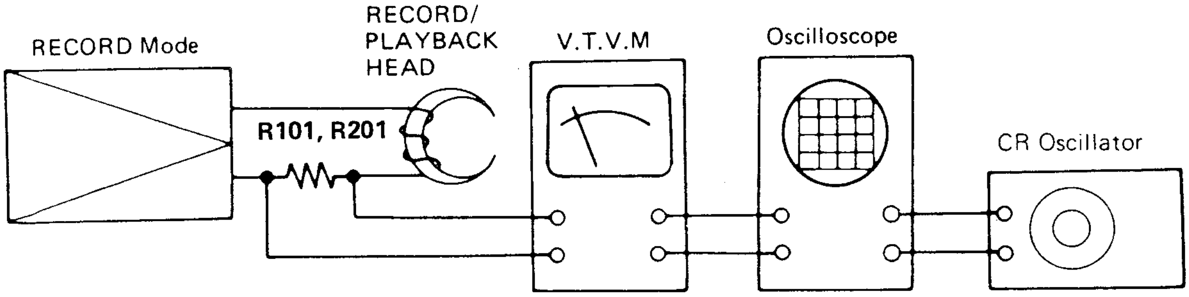

RECORD Mode
RECORD/
PLAYBACK
HEAD
V.T.V.M
Oscilloscope
R101, R201
CR Oscillator

Figure 14–2

■ RECORD AMPLIFIER ERASE CURRENT CHECK

(Refer to Figure 15–1)

1. Connect the V.T.V.M. across the resistor (R301) found on the record/playback PWB.
2. Set the tape selector at "normal" and Dolby N.R. switch (SW3) at "off" position, respectively.
3. Set the unit in Record mode and check, on the V.T.V.M., that the erase current here is 50 to 110 mV.
4. Next, set the tape selector at "CrO₂" position and make sure that the reading now become 80 to 140 mV.

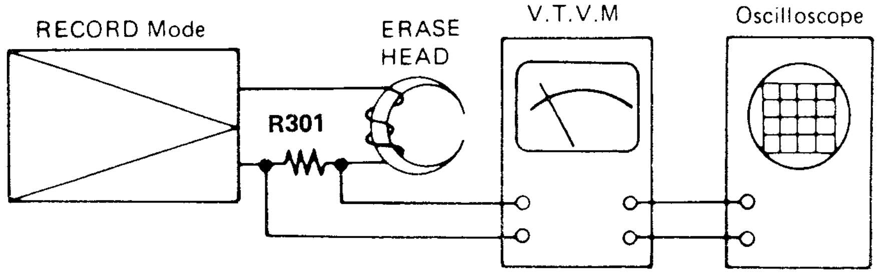

RECORD Mode
ERASE HEAD
R301
V.T.V.M
Oscilloscope

Figure 15–1

■ OPTO PEAK LEVEL DISPALY METER SENSITIVITY ADJUSTMENT

(Refer to Figure 15–2)

1. Connect a VTVM between the test point (TP102, 202) and ground.
2. Set the Dolby NR switch (SW3)/peak hold switch (SW9) at "off" and the microphone recording level controls (VR104 and VR204) at "minimum" position.
3. Connect a CR oscillator to the line input terminal, and apply signals (400 Hz, –10 dB) to the unit.
4. Set the unit in record mode, and adjust the line/DIN recording level control (VR103-Lch or VR203-Rch) so that the VTVM reads 550 ± 10 mV.
5. Rotate the semi-variable resistor (VR901, 902) fully counterclockwise, then turn it back to such an extent as to cause flashing of the 0 dB segment.

Note:

- The 0 dB segment shall go on with 560 mV.
- The +1 dB segment shall go off or flash with 660 mV.

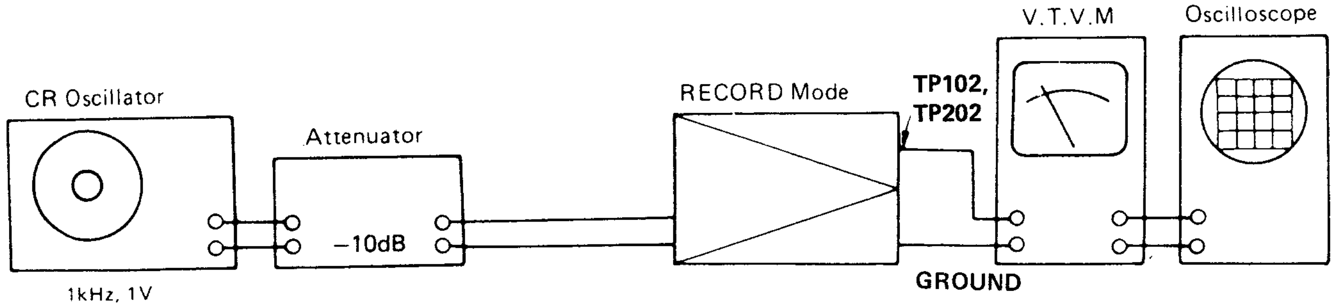

CR Oscillator
1kHz, 1V
Attenuator
–10dB
RECORD Mode
TP102,
TP202
V.T.V.M
Oscilloscope
GROUND

Figure 15–2

■ RECORD AMPLIFIER SENSITIVITY ADJUSTMENT

Note:

The procedures here shall follow those in the previous "Opto Peak Level Display Meter sensitivity Adjustment".

1. Connect a VTVM between the test point (TP102 or TP202) and ground.
2. Set the Dolby NR switch (SW3) at "off" position.
3. Connect a CR oscillator to the line input terminal (SO101A or SO101B), and apply signals (400 Hz) to the unit.
4. Set the unit in record mode, and bring the line/DIN recordind level controls (VR103 and VR203) and microphone recording level controls (VR101 and VR201) to "maximum" position respectively.
5. Rotate the semi-variable resistor (VR105-Lch or VR205-Rch) fully clockwise, and adjust the attenuator so that the 0 dB segment of the opto peak level display meter lights up (with the VTVM reading 580 mV). The attenuator shall not be outside its specified values at the time.
6. After the above-mentationed "line-in" measurement, further apply signals to DIN input terminal, say, the record/playback socket (SO101C), and also to the mic input jacks (J101-Lch and J102-Rch) and proceed to measurement by taking the steps 4 and 5 once more. For the "min-in" measurement signals shall be applied to R-channel and L-channel at a time.
7. In this way, the output difference between R- and L-channel can be measured at each input terminal.

Input terminal	Record amp. sensitivity	Channel-to channel difference
Line-in	–21 ± 3 dB	0.25 dB
Mic in	–71 ± 3 dB	3 dB
DIN in	–57 ± 3 dB	3 dB

(at 0 dB)

Table

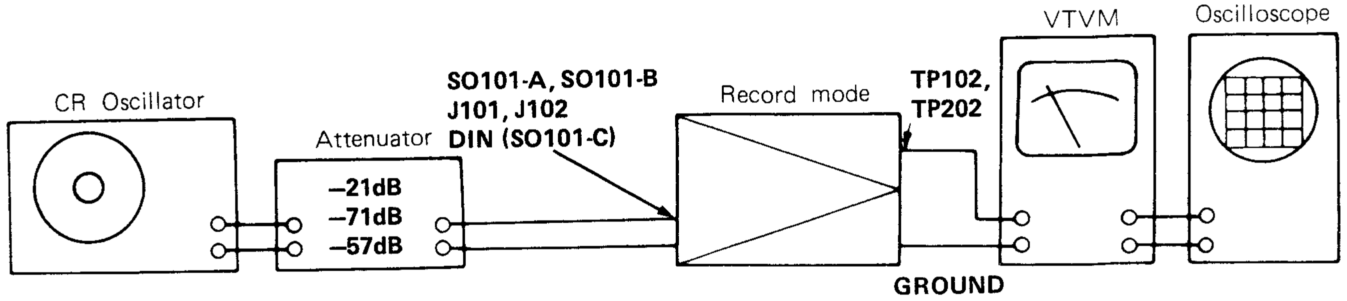

CR Oscillator
Attenuator
–21dB
–71dB
–57dB
SO101-A, SO101-B
J101, J102
DIN (SO101-C)
Record mode
TP102,
TP202
VTVM
Oscilloscope
GROUND

Figure 16–1

■ LINE/DIN RECORDING LEVEL GANGERROR CHECK

(Refer to Figure 16–2)

This checking is to be carried out only after the record amplifier sensitivity adjustment.

1. Connect CR oscillator to the line input terminal (SO101-A or SO101-B), and apply signal [1 kHz, signal level –10 dB (0 dB = 1 V)] to the unit.
2. Bring the line/DIN recording level control to half its maximum value (the graduation "5" of the meter).
3. See that the right-to-left channel difference by VTVM reading is within 1 dB.
4. If not so in either case, adjust the semi-variable resistor (VR-105 or VR205), a record sensitivity control, so that the higher value decreases to the lower one in order for their difference to become no more than 1 dB: the specified data in the previous "Adjustment of Record Amplifier Sensitivity" must be satisfied.

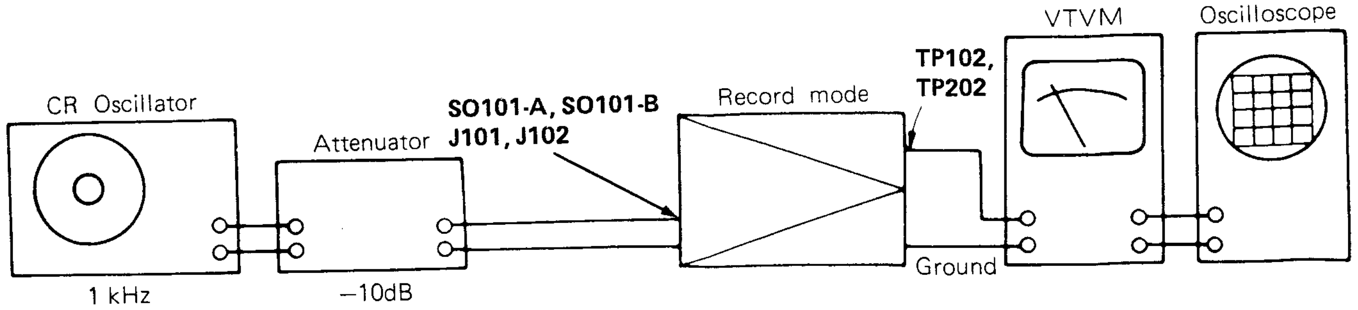

CR Oscillator
1 kHz
Attenuator
–10dB
SO101-A, SO101-B
J101, J102
Record mode
TP102,
TP202
Ground
VTVM
Oscilloscope

Figure 16–2

■ RECORD AMPLIFIER CURRENT ADJUSTMENT

(Refer to Figure 17–1)

1. Connect the V.T.V.M. across the resistor (R101, R201) found on the record/playback P.W. Board.
2. Set the tape selector at "normal" and Dolby N.R. switch (SW3) at "off" position, respectively.
3. Set the Microphone recording level control to "0" position. For this work, the semi-variable resistor (VR107, VR207) must be kept at their fully clockwise position.
4. Load the unit with a tape. (non-recorded)
5. Connect a C.R. oscillator to the line input terminal (SO101-A, SO101-B) and apply signals (1 kHz, –10 dB (0 dB = 1 V)) to the unit.
6. Set the unit in record mode and adjust the line/DIN recording level control (VR103, 203) so that the 0 dB segment of the opto peak level display meter lights up and adjust the record amplifier current adjusting semi-variable resistor (VR106, VR206) so that V.T.V.M. reading become 5 mV.
7. Next, set the tape selector at "Fe-Cr" position and make sure that the reading now become 4.8 ~ 6.8 mV.
8. Next, set the tape selector at "Cr-O$_2$" position and make sure that the reading now become 5.6 ~ 7.6 mV.

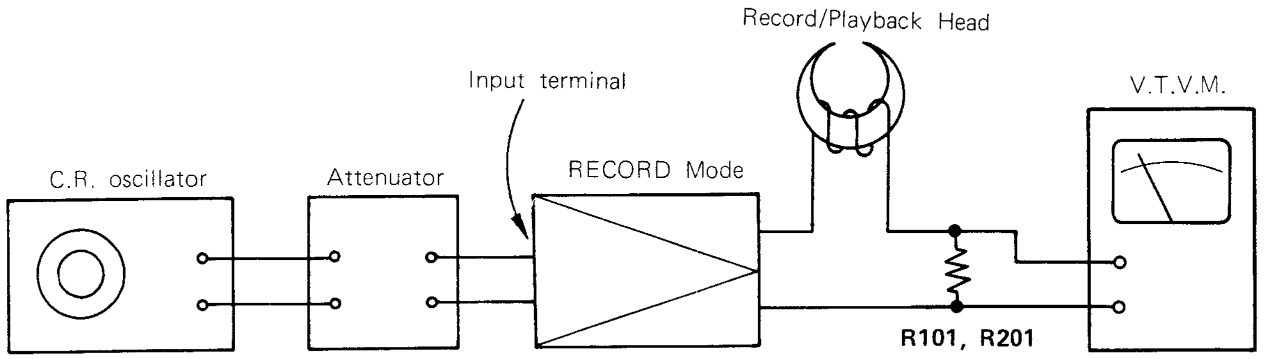


Figure 17–1

■ DOLBY NR CIRCUIT CHECK

(Refer to Figure 17–2)

1. Connect the V.T.V.M. between the test point (TP102, TP202) located on the record/playback PWB and ground.
2. Set the Microphone Recording Level Control to "0" position, the equalizer switch (SW2) at "120μs" and the bias switch (SW3) at "low" position, respectively.
3. Place the Dolby NR switch (SW5) at "on" position.
4. Load the unit with a normal tape. (non-recorded)
5. Connect a C.R. oscillator to the line input terminal and apply signals (100 Hz, –35 dB (0 dB = 1 V)) to the unit.
6. Set the unit in Record mode and adjust the record level control (VR101-A, VR101-B) so that the V.T.V.M. will read 32.6 mV.
7. By the same procedures as above mentioned, do the similar check also for either of 1 kHz, 10 kHz and 12.5 kHz signals to be applied to the unit, and make sure the V.T.V.M.'s indication is normal for each of these signals, according to the Table 17–1 below.
8. Then, apply signals (100 Hz, –50 dB) to the unit and again adjust the said record level control (VR101-A, VR101-B) so that the V.T.V.M. reading will now be 5.8 mV.
9. Similarly to the above step 7, check the V.T.V.M. reading for each of 1 kHz, 10 kHz and 12.5 kHz signals. See the Table 17–2.

Oscillator Frequency	1 KHz	10 KHz	12.5 KHz
VTVM READS	45.7 ~ 81 mV	44.5 ~ 70 mV	42.6 ~ 68.2 mV

Table 17–1

Oscillator Frequency	1 KHz	10 KHz	12.5 KHz
VTVM READS	8.2 ~ 16.4 mV	13.7 ~ 24.9 mV	13.5 ~ 23.4 mV

Table 17–2

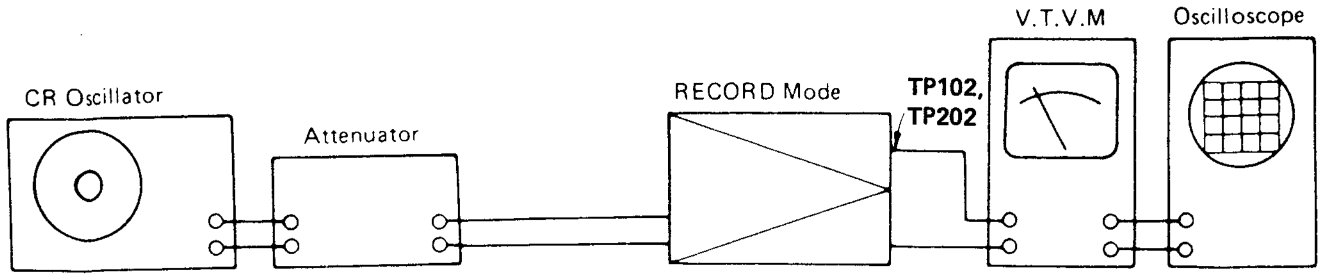


Figure 17–2

■ PLAYBACK SENSITIVITY ADJUSTMENT

(Refer to Figure 18–1)

1. Connect the V.T.V.M. between the test point (TP102, TP202) located on the record/playback PWB and ground.
2. Load the unit with a test tape (MTT-150, 400 Hz, 200pWb/mm, Recorded).
3. Set the tape selector at "normal" and Dolby N.R. switch (SW3) at "off" position, respectively.
4. Set the unit in Play mode and adjust the playback sensitivity adjusting semi-variable resistor (VR101, VR201) so that the V.T.V.M. will read 580 mV.

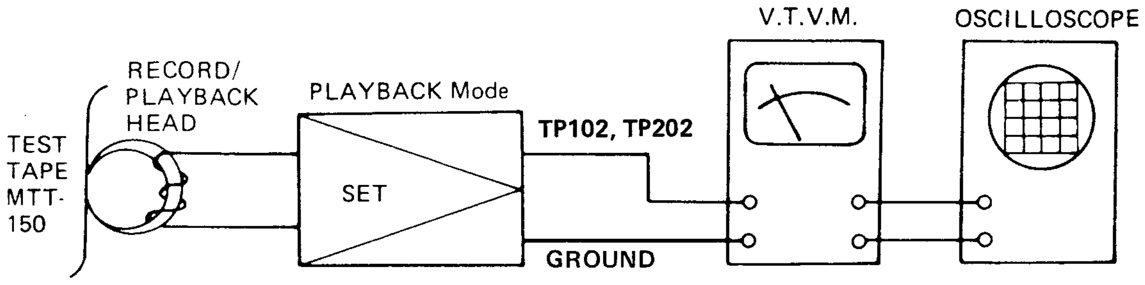


Figure 18–1

■ ADJUSTMENT OF PLAYBACK FREQUENCY CHARACTERISTIC (Refer to Figure 18–2)

1. Connect VTVM to the line output terminal (SO101-D or SO101-E).
2. Load a test tape (MTT-217G, 40 Hz/1 kHz/12.5 kHz).
3. Set the tape selector switch to "normal" and the Dolby N.R. switch (SW3) to "off" position, respectively.
4. Reproduce 1 kHz-recorded part first to consider its output to be 0 dB; then 40 Hz-recorded part and then 12.5 kHz-recorded part; after then, see that the VTVM readings are within the values stated in Table 18–1. In case reproduction of 12.5 kHz signal doesn't satisfy its specified VTVM reading, correct it by adjusting the semi-variable resistor (VR102 or VR202), a playback characteristic control.
5. Next set the tape selector switch to "Cr-O$_2$" position, and considering the output of 1 kHz-signal reproduction to be 0 dB, see that VTVM readings for the other two signals are as specified in Table 18–2.

Normal	40 Hz	–1 ~ +3 dB
	12.5 kHz	–1 ~ +2 dB
Cr-O$_2$	40 Hz	–1 ~ +3 dB
	12.5 kHz	–4.4 ~ –1.4 dB

Table 18–1

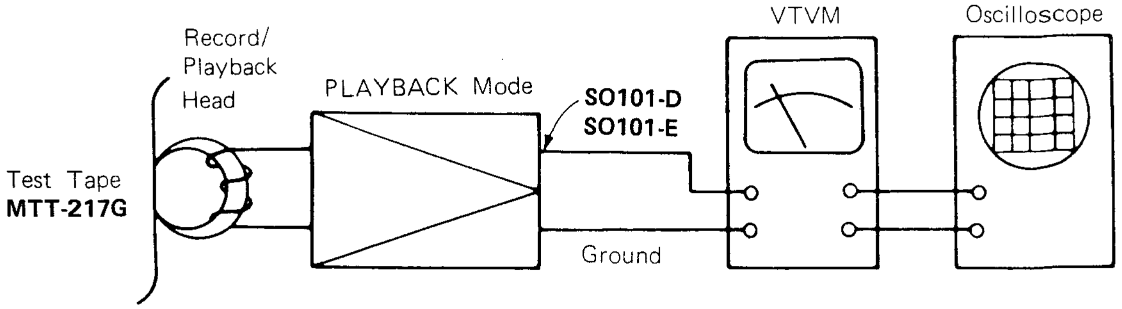


Figure 18–2

■ OVERALL FREQUENCY CHARACTERISTIC

1. Connect VTVM to the line output terminal (SO101-D or SO101-E).
2. Set the tape selector switch to "normal" and the Dolby N.R. switch (SW3) to "off" position, respectively.
3. Load a normal (blank) tape (MTT-502). Rotate the semi-variable resistor (VR107, 207) fully clockwise.
4. Connect CR oscillator to the line input terminal (SO101-A or SO101-B), apply signals (1 kHz −10 dB (0 dB = 1 V)) to the unit, and adjust the line/DIN recording level control (VR103, 203) so that the 0 dB segment of the opto peak level display meter lights up and apply signals [30 Hz, 1 kHz, 6 kHz, 15 kHz, signal level −35 dB (0 dB = 1 V)] to the unit in the order and record them in such tape.
5. Reproduce 1 kHz-recorded part first and consider its output to be 0 dB; then 30 Hz-, 6 kHz- and 15 kHz-recorded parts respectively; after then, see that the VTVM readings are within the values stated in Table 19–1.
6. In case reproduction of 15 kHz signal doesn't satisfy the lower limit (above −2 dB), correct it by adjusting the semi-variable resistor (VR107 or VR207), a high-frequency control; in case it doesn't satisfy the upper limit (below +2 dB), correct it by adjusting the semi-variable resistor (VR301 or VR302), a record bias current control.
7. Next, set the tape selector switch to "Fe-Cr" position, and load a Fe-Cr tape (CS-30).
8. Just like in the steps 4 and 5, record 30 Hz, 1 kHz, 6 kHz and 17 kHz signals and reproduce them; see that VTVM reading are as stated in Table 19–1.
9. Then, change the tape selector switch to "Cr-O₂" position, and load a Cr-O₂ tape (UDXL II).
10. Similarly, record 30 Hz, 1 kHz, 6 kHz and 17 kHz signals and reproduce them; see that VTVM readings are as specified in Table 19–1.

Tape / Frequency	Normal	Fe-Cr	Cr-O₂
30 Hz	0 ± 2 dB	0 ± 2 dB	0 ± 2 dB
1 kHz	0 dB	0 dB	0 dB
6 kHz	0 ± 1 dB	0 ± 1 dB	0 ± 1 dB
15 kHz	0 ± 2 dB	—	—
17 kHz	—	0 ± 2 dB	0 ± 2 dB

Table 19–1

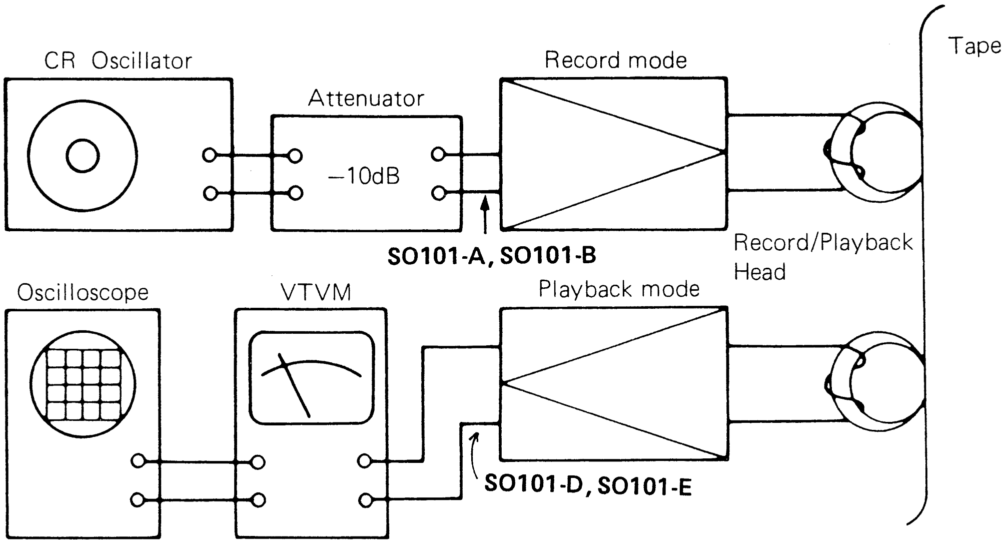


Figure 19–1

■ RECORD/PLAYBACK SENSITIVITY ADJUSTMENT

(Refer to Figure 12–2)

1. Connect the V.T.V.M. between the test point (TP102, TP202) located on the record/playback PWB and ground.
2. Set the tape selector at "normal" and Dolby N.R. switch (SW3) at "off" position, respectively.
3. Load a normal tape. (MTT-502) (non-recorded)
4. Connect a C.R. oscillator to the line input terminal SO101-A, SO101-B and apply signals (1 kHz, –10 dB (0 dB = 1 V)) to the unit.
5. Set the unit in Record mode and adjust the line/DIN recording level control (VR103, VR203) so that the V.T.V.M. will indicate 580 mV.
6. Reproduce the tape which has been recorded at the above step 5, and adjust the record sensitivity control semi-variable resistor (VR106, VR206) so that the V.T.V.M. reading becomes 580 mV.
7. Set the tape selector switch to "Fe-Cr" position, and load a Fe-Cr tape (CS-30).
8. Apply a signal [1 kHz, signal level –10 dB (0 dB = 1 V)] to the unit and record it, and adjust the line/DIN recording level control (VR103 or VR203) so that VTVM reads 580 mV.
9. Reproduce the recorded tape, and see that VTVM reading is in the range from 490 to 690 mV.
10. Next, set the tape selector switch to "Cr-O_2" position, and load a Cr-O_2 tape (UDXLⅡ).
11. Follow the same procedure as in the steps 8 and 9, also see that VTVM reading is in the range from 490 to 690 mV.

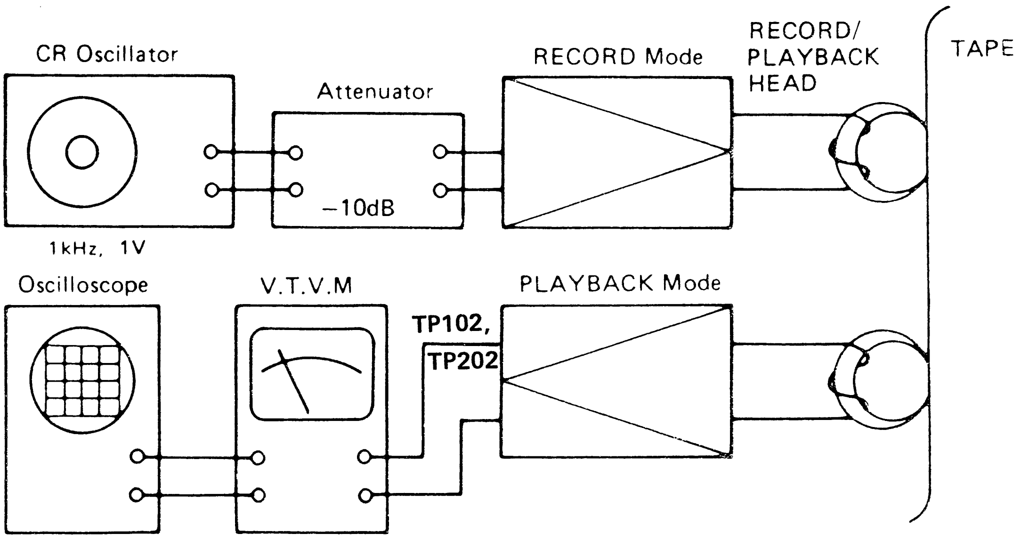


Figure 20–1

■ ADJUSTMENT OF 3 V POWER SUPPLY TO MICRO-PROCESSOR-CONTROLLED UNIT

1. Connect a VTVM between the test point (TP13) and ground. (Power Supply PWB)
2. Set the power switch at "on" position, adjust the semi-variable resistor (VR501) so that output voltage, on the VTVM, comes to accord with the values shown in Fig. 21–2 (which depend upon change of room temperatures, however). Select the central value as far as possible.

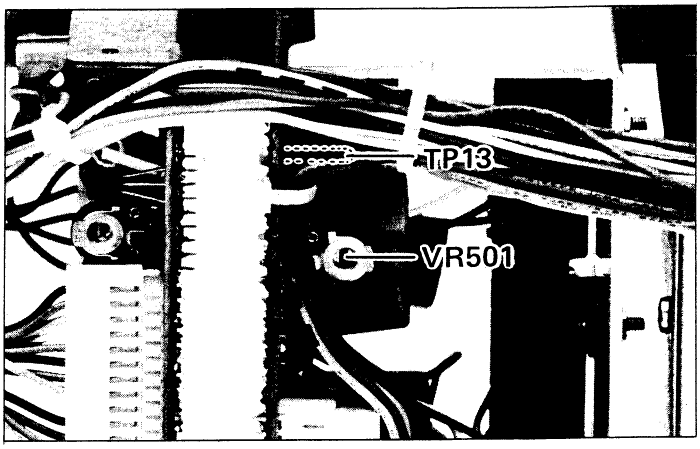


Figure 21–1

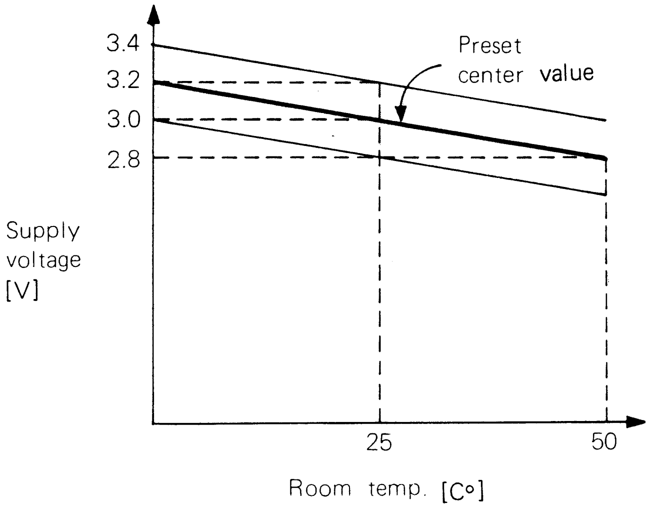


Figure 21–2

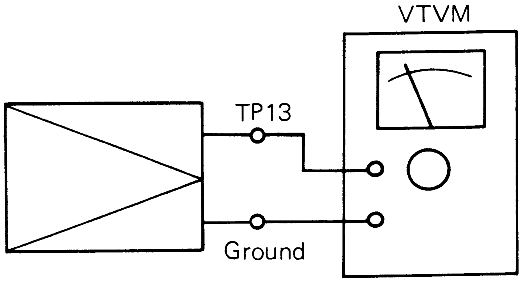


Figure 21–3

CIRCUIT DESCRIPTION

<Tape Deck Control Section>

The model RT-7100H/HB includes a control circuit quite centered at the 4-bit/1-chip microprocessor, through which it can offer automatic operations as of APMS (Automatic and Programmable Music Selector), tape counter memorization and other valuable aids in operating the tape deck. This proves a remarkable difference from the conventional type of tape decks.

Here, let us explain in details what this microprocessor-centered circuit is and how it behaves.

■ INPUT/OUTPUT TERMINALS OF MICROPROCESSOR-CONTROLLED UNIT

The microprocessor-controlled unit has two connectors (CNP/S43 and CNP/S44) as input and output terminals through which it controls the tape deck section: the CNP43 is a 13-pin plug and the CNP44, an 18-pin plug and what roles they serve will be shown in the Table 23–1.

Pins ⑤ thru ⑧ ($F_1 \sim F_4$) of the 18-pin plug (CNP44) form an output terminal and 4-bit signal comes out of these pins so that the operations of the tape deck section submit to a substantial control by it.

This 4-bit signal is further decoded by the instruction decoder (IC2) to become 16-bit signal which aims at driving the mechanical controls, lighting the LEDs, muting at the time of recording and playback, turning on/off of recording bias, etc.

Pins ③ thru ⑪ ($O_{21} \sim O_{26}$, $O_{44} \sim O_{46}$) of the 13-pin plug (CNP43) form an output terminal while pin ⑫ (K4) of it does an input terminal; their input and output signals allow the mechanical controls of the tape deck section to be operated manually. Leaving the output terminal ($O_{21} \sim O_{26}$, $O_{44} \sim O_{46}$), the output signal is applied to the mechanisum operation Button (SW24 ~ SW31) through which it is switched over to fit every mode of the tape deck manually designated at that time, and then it enters the input terminal (K4): as a result, the microprocessor reads the incoming instruction to allow starting the designated mode of the tape deck section.

Pins ⑪ thru ⑭ (O_{18}, O_{28}, O_{38} and O_{48}) of the 18-pin plug (CNP44) form an output terminal and pin ⑮ ($\overline{K}_1$) of it is an input terminal; their input and output signals permit the tape deck section to turn on or off. Leaving the output terminal (O_{18}, O_{28}, O_{38} and O_{48}), the output signal is applied to the switch (SW20, SW21 or SW22) through which it is turned on or off, and then it comes back to the input terminal ($\overline{K}_1$); as a result, the microprocessor reads the incoming instruction to allow the tape deck section to be turned on or off.

Pin ② (ACL), pin ③ (β) pin ④ (α) of the 18-pin plug (CNP44) form an input terminal through which the microprocessor accepts an external voltage while judging its level at the same time.

Pin ② (OSC OUT) of the 13-pin plug (CNP43) is an input terminal through which a clock pulse (32.76 kHz) is applied to the microprocessor to control itself; pin ① and pin ⑬ (+3 V) of the 13-pin plug, and pin ① (+3 V) of the 18-pin plug form a power input terminal through which a power (+3 V) subjected to a temperature compensation is fed to the microprocessor from the power supply circuit.

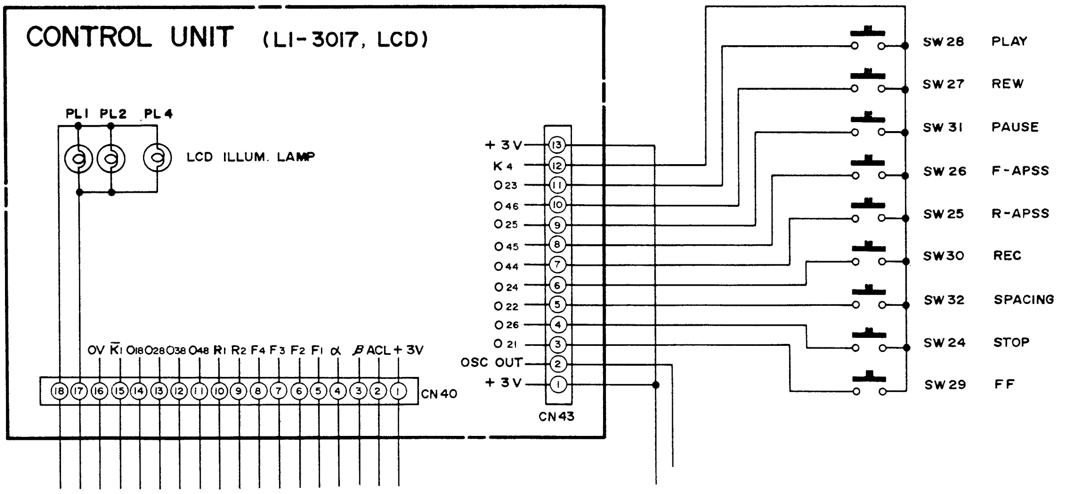


Figure 22–1

13-pin plug (CNP43):

Pin No.	Name	Input/Output	Application
1	+3 V	Input	To increase against-static-electricity resistance
2	OSC OUT	Input	LSI clock generator input (32.76 kHz)
3	O_{21}	Output	Manual fast forward strobe output
4	O_{26}	Output	Manual stop strobe output
5	O_{22}	Output	Manual auto spacing strobe output
6	O_{24}	Output	Manual record strobe output
7	O_{44}	Output	Manual APSS reverse strobe output
8	O_{45}	Output	Manual APSS forward strobe output
9	O_{25}	Output	Manual pause strobe output
10	O_{46}	Output	Manual rewind strobe output
11	O_{23}	Output	Manual play strobe output
12	K_4	Input	Strobe input of $O_{21} \sim O_{26}$, $O_{44} \sim O_{46}$
13	+3 V	Input	To increase against-static-electricity resistance.

18-pin plug (CNP44):

<table>
<tr><th>Pin No.</th><th>Name</th><th>Input/Output</th><th colspan="2">Application</th></tr>
<tr><td>1</td><td>+3 V</td><td>Input</td><td colspan="2">Microprocessor power input</td></tr>
<tr><td>2</td><td>ACL</td><td>Input</td><td colspan="2">Microprocessor auto clear signal input</td></tr>
<tr><td>3</td><td>β</td><td>Input</td><td colspan="2">APSS/APMS program-to-program space signal input</td></tr>
<tr><td>4</td><td>α</td><td>Input</td><td colspan="2">Count pulse signal input for tape counter</td></tr>
<tr><td>5</td><td>F_1</td><td>Output</td><td rowspan="2">Tape deck control output data</td><td rowspan="4">Tape deck control output</td></tr>
<tr><td>6</td><td>F_2</td><td>Output</td></tr>
<tr><td>7</td><td>F_3</td><td>Output</td><td>Clock output for shift register (IC2)</td></tr>
<tr><td>8</td><td>F_4</td><td>Output</td><td>Clear pulse/clock output for shift register/latch circuit (IC2)</td></tr>
<tr><td>9</td><td>R_2</td><td>Output</td><td colspan="2">Timer standby play/record detection strobe output</td></tr>
<tr><td>10</td><td>R_1</td><td>Output</td><td colspan="2">Beep tone control output</td></tr>
<tr><td>11</td><td>O_{48}</td><td>Output</td><td colspan="2">Power state on/off detection strobe output</td></tr>
<tr><td>12</td><td>O_{38}</td><td>Output</td><td colspan="2">Cassette loading/cassette holder on/off detection strobe output</td></tr>
<tr><td>13</td><td>O_{28}</td><td>Output</td><td colspan="2">Erase protection on/off detection strobe output</td></tr>
<tr><td>14</td><td>O_{18}</td><td>Output</td><td colspan="2">Timer standby on/off detection stobe output</td></tr>
<tr><td>15</td><td>$\overline{K}_1$</td><td>Input</td><td colspan="2">Strobe input for O_{18}, O_{28}, O_{38}, O_{48} and R_2</td></tr>
<tr><td>16</td><td>0 V</td><td>Input</td><td colspan="2">Ground</td></tr>
<tr><td>17</td><td>0 V</td><td>Input</td><td colspan="2" rowspan="2">For lighting up LCD front and back illumination lamps</td></tr>
<tr><td>18</td><td>+10.5 V</td><td>Input</td></tr>
</table>

Table 23–1

■ POWER SUPPLY CIRCUIT FOR MICROPROCESSOR-CONTROLLED UNIT

1. This power supply circuit is composed of transistors (Q503, Q504 and Q506), Zener diodes (ZD502 and ZD504) and thermistor (TH501), and it feeds a power, stabilized at DC 3 V, to the microprocessor-controlled unit and other circuits (Q5 to Q8). A power caused by the power supply circuit is made to have +5 V first by the transistor (Q503) and Zener diode (ZD502), and then by the transistor (Q504) and thermistor (TH501) to have +3 V, which is perfectly well stabilized and temperature-compensated too. In the case where the optional timer AD-200T (H, B, S or D) is put in use together by means of a 4-pin 360° cable, a power of approx. 11 V comes out of its timer socket (SO502) ← pin ④ – and it is delivered to the tape deck RT-7100H/HB. This power is also made to have +5 V first by the transistor (Q506) and Zener diode (ZD504) and then by the transistor (Q504) and thermistor (TH501) to have +3 V, the one well stabilized and temperature-compensated, in the same manner as in the above-mentioned.
   This leads to that even when the power switch of the tape deck is kept turned off, a power from the optional timer remains alive to be fed to the microprocessor-controlled unit, so the contents of the memory of the microprocessor-controlled unit remain as they are. Incidentally, the said +5 V power (also stabilized) is fed as a back-up voltage to every circuit (IC1, IC2, Q1 to Q4, Q9, Q11 and Q17).
2. About a temperature compensation of the power supply (DC 3 V) to the microprocessor-controlled unit:
   The display of the microprocessor-controlled unit is enabled by its included LCDs (Liquid Crystal Display), but the property of the LCDs is somewhat affected by the nearby temperature. In other words, the lower the room temperature, the slower the display responsing velocity; the higher the temperature, the swifter the velocity, which may cause the unexpected segment to light up. To eliminate this, a temperature compensation aid is included in the circuit which shows a specific characteristic as in Fig. 24—1 below: as the temperature lowers, the power supply increases and vice versa.

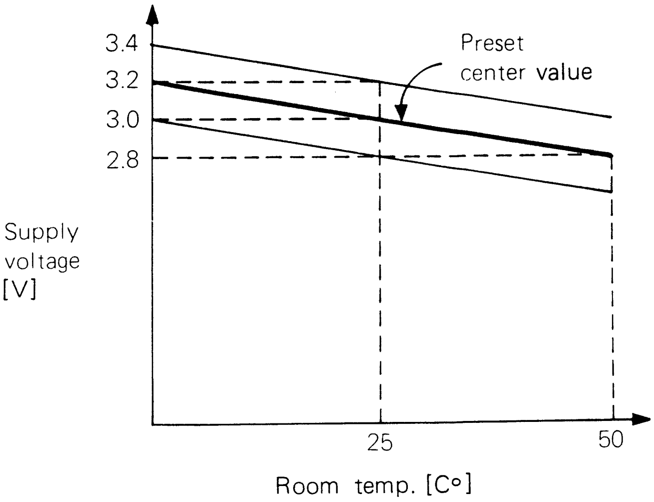


Figure 24—1

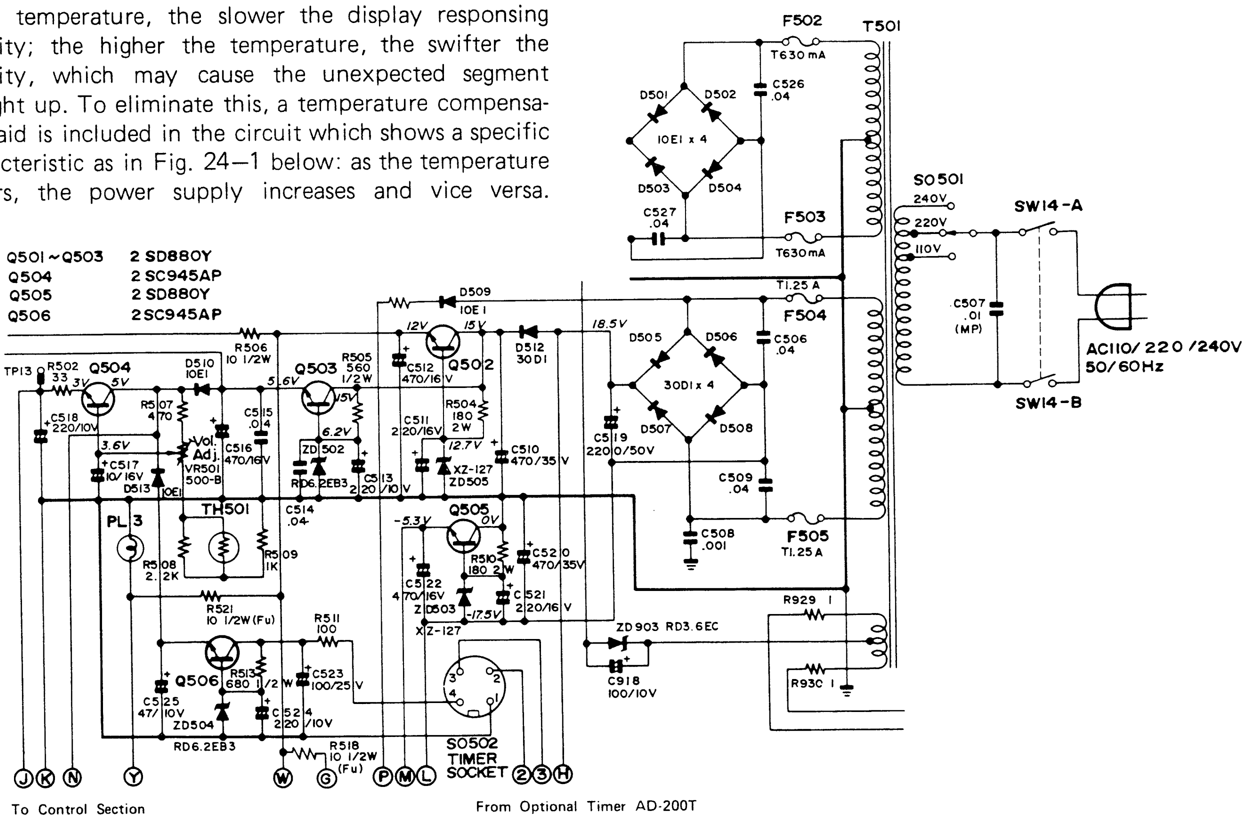

Q501~Q503 2 SD880Y
Q504 2 SC945AP
Q505 2 SD880Y
Q506 2SC945AP
F502
T630mA
T501
C526 .04
D501
D502
10E1 x 4
D503
D504
C527 .04
F503
T630mA
SO501
240V
220V
110V
SW14-A
SW14-B
C507 .01 (MP)
AC110/220/240V 50/60Hz
T1.25 A
F504
D505
D506
30D1 x 4
D507
D508
C506 .04
C509 .04
C508 .001
F505
T1.25A
C519 2200/50V
18.5V
D509 10E1
D512 30D1
Q502
12V
15V
C512 470/16V
R504 180 2W
C511 220/16V
12.7V
XZ-127 ZD505
C510 470/35V
R505 560 1/2W
Q503
5.6V
5V
6.2V
ZD502
RD6.2EB3
C513 220/10V
C514 .04
R506 10 1/2W
D510 10E1
C515 .014
C516 470/16V
Vol. Adj.
VR501 500-B
TP13
R502 33
Q504
3V
5V
R507 470
C518 220/10V
3.6V
C517 10/16V
D513 10E1
PL3
TH501
R508 2.2K
R509 1K
R521 10 1/2W (Fu)
Q505
-5.3V
0V
R510 180 2W
C520 470/35V
C522 470/16V
ZD503
XZ-127
-17.5V
C521 220/16V
R511 100
Q506
R513 680 1/2W
C523 100/25V
C525 47/10V
ZD504
RD6.2EB3
C524 220/10V
R518 10 1/2W (Fu)
SO502 TIMER SOCKET
1
2
3
4
ZD903 RD3.6EC
C918 100/10V
R929 1
R930 1
J
K
N
Y
W
G
P
M
L
2
3
H
To Control Section
From Optional Timer AD-200T

Figure 24—2

■ CLOCK OSCILLATOR

This clock oscillator consists of a C-MOS inverter (IC1) and a crystal vibrator (X1), and it produces 32.768 kHz clock pulses (square wave, DC 5 V) which ensures a steady operation of the microprocessor-controlled unit. The clock pluse (DC 5 V) is applied to the 3 V level interface circuit (Q5) where it is level-converted to have DC 3 V instead of DC 5 V, and only after this, it enters the microprocessor-controlled unit.

Where the timer AD-200T (H, B, S or D) is optionally put in use by means an 4-pin 360° cable, as we have discussed in the Para. "Power Supply Circuit for Microprocessor-Controlled Unit", it follows that even if the power switch of the tape deck is turned off, the +5 V power is fed as a back-up voltage to the C-MOS inverter (C1), resulting in the clock oscillator keeps the operation to apply its pulses to the microprocessor-controlled unit.

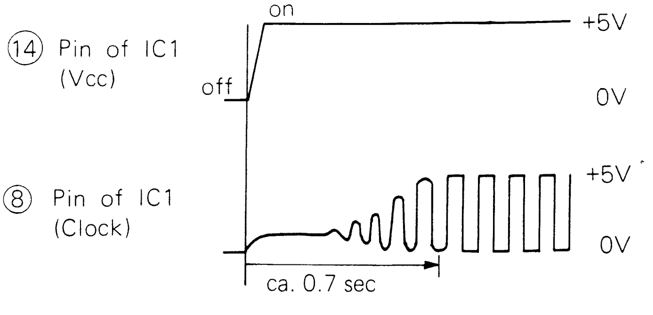
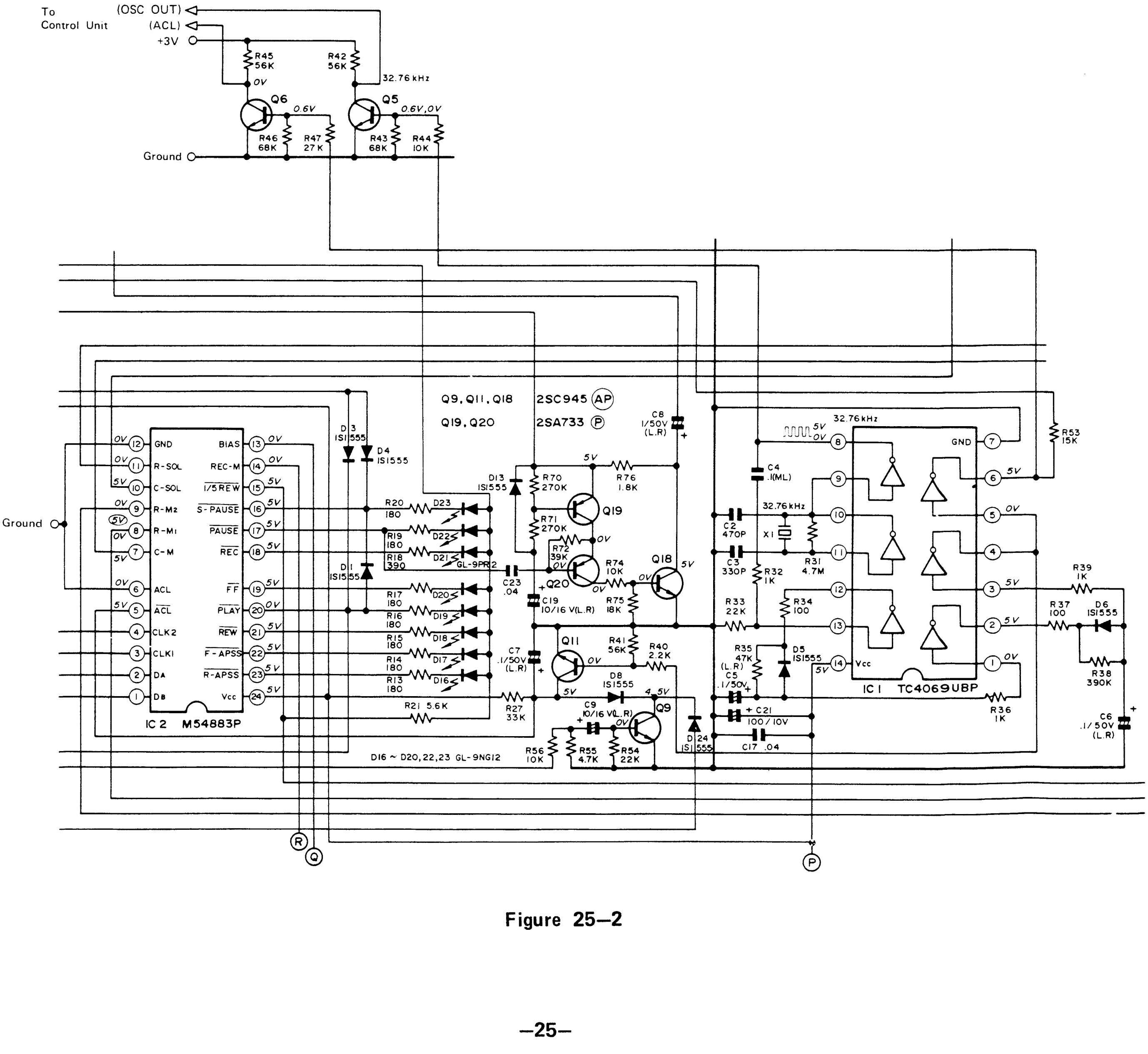


Figure 25–1



To Control Unit
(OSC OUT)
(ACL)
+3V
R45 56K
R42 56K
32.76 kHz
Q6
Q5
0.6V
0.6V,0V
R46 68K
R47 27K
R43 68K
R44 10K
Ground
Q9, Q11, Q18 2SC945 (AP)
Q19, Q20 2SA733 (P)
C8 1/50V (L.R)
D3 1S1555
D4 1S1555
IC2 M54883P
GND
R-SOL
C-SOL
R-M2
R-M1
C-M
ACL
ACL
CLK2
CLK1
DA
DB
BIAS
REC-M
I/5REW
S-PAUSE
PAUSE
REC
FF
PLAY
REW
F-APSS
R-APSS
Vcc
D13 1S1555
R70 270K
R76 1.8K
R71 270K
R72 39K
R74 10K
R75 18K
Q19
Q20
Q18
C23 .04
C19 10/16 V(L.R)
R20 180
R19 180
R18 390
R17 180
R16 180
R15 180
R14 180
R13 180
D1 1S1555
GL-9PR12
R21 5.6K
R27 33K
C7 .1/50V (L.R)
Q11
R41 56K
R40 2.2K
D8 1S1555
C9 10/16 V(L.R)
Q9
R56 10K
R55 4.7K
R54 22K
D16 ~ D20,22,23 GL-9NG12
D24 1S1555
C4 .1(ML)
C2 470P
C3 330P
X1
R32 1K
R31 4.7M
R33 22K
R34 100
R35 47K (L.R)
C5 .1/50V
D5 1S1555
C21 100/10V
C17 .04
IC1 TC4069UBP
Vcc
GND
R53 15K
R39 1K
R37 100
D6 1S1555
R38 390K
R36 1K
C6 .1/50V (L.R)
Ground
Ⓡ
Ⓠ
Ⓟ

Figure 25–2

■ ACL (Auto Clear) OPERATION OF MICROPROCESSOR-CONTROLLED UNIT

The ACL signal is changed from "Low" (0 V) to "High" (+3 V) level instantly when the power switch (SW14) is switched on; this state continues for a very short time, however. That is, the ACL signal again changes from "High" to "Low" level about 40 msec after the clock oscillator has got stabilized (this is caused about 0.7 sec after the turn-on of the power switch); at the very moment, the microprocessor is automatically cleared of its contents. Here, it must be noted that the ACL signal shall become "Low" level infalliably in time to the stabilization of the clock oscillator: that is, should the ACL signal get active (to become "Low" level) even a very little prior to the stabilization of the clock oscillator, the microprocessor, instead of assuming the normal auto clear operation, will move erratically or exhibit no motion at all.

To overcome this problem, such a circuit design is employed that it can detect a time just when the clock oscillator starts and at the very moment, the ALC signal is changed from "High" to "Low" level. Let us consider this circuitry motion hereunder. Fig. 26–1 reveals the potential and action of every pin of the C-MOS inverter (IC1). As seen from it, a detection start is performed by the inverter, diode (D5) and electrolytic capacitor (C5), all between pins ⑫ and ⑬ of the C-MOS inverter (IC1), and by the inverter between pins ① and ② as well. When the power switch (SW14) is turned on, Vcc power is caused and it is applied to pin ⑭ of the C-MOS inverter (IC1), and about 30 msec later, pin ⑫ goes to "High" level. Thereafter, as soon as the clock oscillation begins, clock pulse is applied to pin ⑫ and as this pin repeats to become "High" and go back to "Low" level, the potential at the anode of the electrolytic capacitor (C5) decreases, so the potential impressed on pin ① reaches "Low" level.

This results in the inverter in the first-stage causes the potential of pin ② to change from "Low" to "High" level, thereby charging the electrolytic capacitor (C6) across the resistors (R37 and R38). If this charge voltag of the electrolytic capacitor (C6) exceeds a threshold voltage of the next-stage inverter (between pins ③ and ④), the potential at pin ④ is changed from "High" to "Low" level. And the potential at pin ⑥ is changed from "Low" to "High" level by the other inverter (between pins ⑤ and ⑥), and it is applied to the base of transistor (Q6); thus, the transistor (Q6) is turned on so that ACL signal which has so far been at "High" (+3 V) level is changed to "Low" (0 V) level, thereby causing the microprocessor to clear its contents automatically.

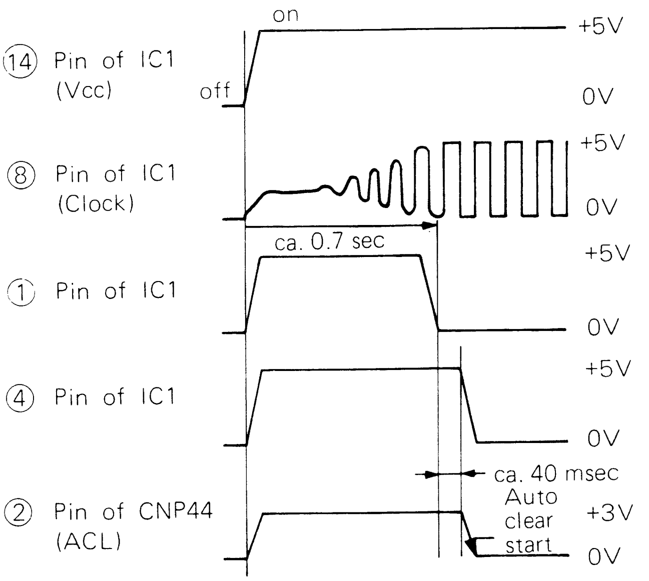


Figure 26–1

■ $\overline{\text{ACL}}$ SIGNAL OF INSTRUCTION DECODER (IC2)

This $\overline{\text{ACL}}$ signal is caused the moment the power switch (SW14) is turned on, and it is applied to the instruction decoder (IC2) to clear all the outputs of this decoder. As in the case of the ACL signal previously explained, the $\overline{\text{ACL}}$ signal also continues its "Low" level from the time the power switch (SW14) is turned on until the clock oscillator has got stabilized, during which it is applied to pin ⑤ of the instruction decoder (IC2). This is devised to overcome an undesired phenomenon that the microprocessor may sometimes produce erratical signals before its auto clear operation; say, whether or not the unwanted signals are applied to the instruction decoder (IC2), all their output is cleared by the $\overline{\text{ACL}}$ signal generated at the same time.

In Fig. 26–2, the signal at pin ④ of the C-MOS inverter (IC1) is caused in the same fashion as the previously mentioned ACL signal, and it is applied to the base of the transistor (Q11).

As the power switch (SW14) is turned on and the clock oscillator gets steady to operate, the potential at pin ④ of the C-MOS inverter (IC1) changes "High" to "Low" level, resulting in the transistor (Q11) gets turned off. Thus, the $\overline{\text{ACL}}$ signal changes from "Low" (0V) to "High" (+2.2V) level so as to cause the instruction decoder (IC2) to stop its auto clear operation.

If a power failure, if very momentarily, is encountered or the power switch (SW14) is turned off for quite a short moment, the transistor (Q9) gets turned on right after the power has resumed so the $\overline{\text{ACL}}$ signal is change to "Low" (0V) level: also in this case, such auto clea operation is conducted.

Note, however, that a portion of the instruction decoder (IC2) alone, the latch circuit (a momentary memory of signals), is subjected to the auto clear by the $\overline{\text{ACL}}$ signal.

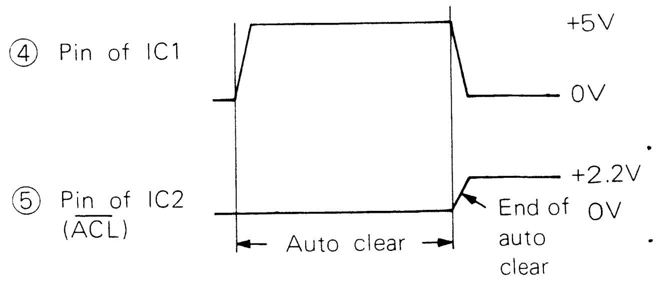
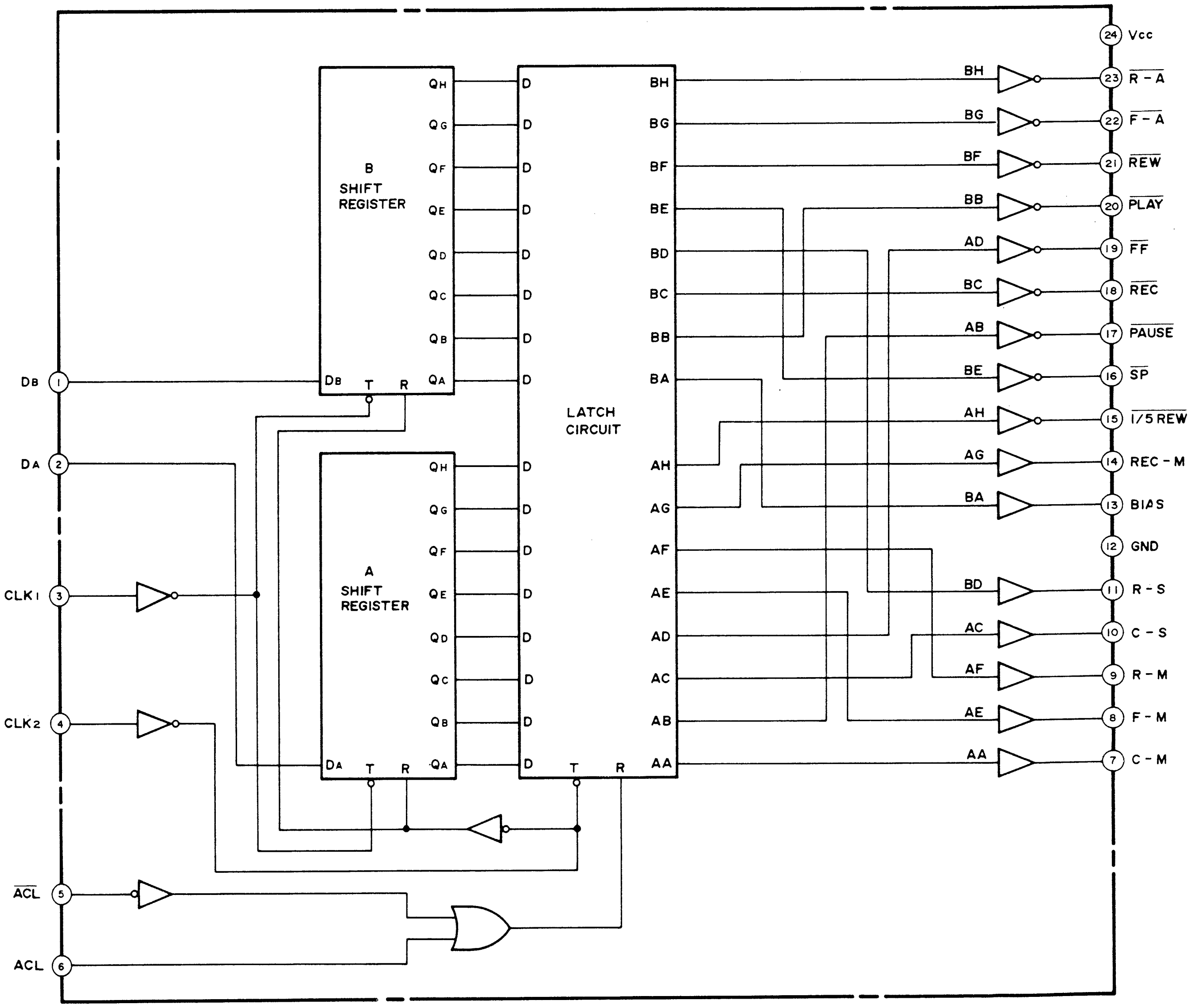


Figure 26–2


DB 1
DA 2
CLK1 3
CLK2 4
ACL 5
ACL 6
B SHIFT REGISTER
A SHIFT REGISTER
QH QG QF QE QD QC QB QA
DB T R
DA T R
LATCH CIRCUIT
D
T R
BH BG BF BE BD BC BB BA
AH AG AF AE AD AC AB AA
24 Vcc
23 R - A
22 F - A
21 REW
20 PLAY
19 FF
18 REC
17 PAUSE
16 SP
15 1/5 REW
14 REC - M
13 BIAS
12 GND
11 R - S
10 C - S
9 R - M
8 F - M
7 C - M

RH-IX1161AFZZ (M54883P)

Figure 27–1 BLOCK DIAGRAM OF INSTRUCTION DECODER (IC2)

■ INPUT OF INSTRUCTION DECODER (IC2)

The instruction decoder (IC2) consists of a pair of 8-bit registers and a latch circuit with a 16-bit driver, and it is arranged to form a serial input/parallel output system. An input to this decoder is 4-bit signal (F1 to F4) from the microprocessor-controlled unit and this signal is decoded here to 16-bit output signal to control the tape deck section, and also to drive the LEDs (D16 to D23) — to indicate which mode the set is now situated at — into conduction.

1. Input signals at the terminals DA, DB, CLK1 and CLK2
   The 4-bit signal (F1 to F4) coming from the microprocessor is passed on to the 3V—to—5V interface (Q1 to Q4) where its potential is changed from 3V to 5V, then it is supplied to the input terminals (DA, DB, CLK1 and CLK2) of the instruction decoder (IC2). What roles these signals are to serve are:
   - DA (F1) and DB (F2) are data input.
   - CLK1 (F3) is clock input to the shift register inside the instruction decoder (IC2).
   - CLK2 (F4) is either clock input to the latch circuit inside the instruction decoder (IC2) or reset input to the shift register.
2. About the input signal which initiates record/pause mode when the record button is pushed:
   As shown in Fig. 28—1, the data (DA or DB) entering the instruction decorder (IC2) is read in the shift register while the clock (CLK1) signal is caused at the same time and it starts to rise up according to the pulse of such data (DA or DB).
   Next, the clock (CLK2) signal is caused to transfer the data from the shift register to the latch circuit; simultaneously, the shift register is reset to get ready to accept the next coming data (DA or DB).

Here, it is noted that as shown in Fig. 28—2, the clock (CLK1) signal shall rise up a little later than the data (DA or DB) pulse does: this is the delay time (tsu) during which the data signal grows active enough to be read in the shift register. This time lag is ensured by the capacitor (C1) of 0.04MFD which is additionally attached to the bias resistance and to the base of the transistor (Q3) inside the 3V—to—5V interface circuit.

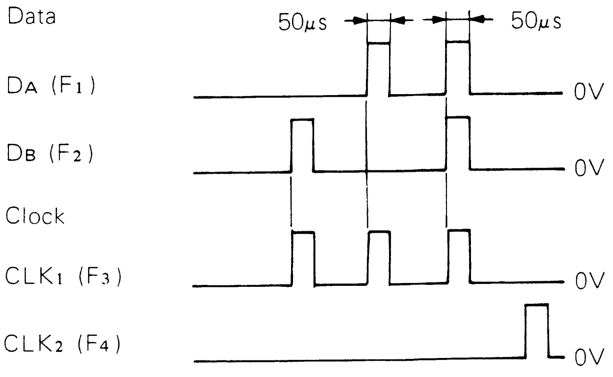

Data
50μs
50μs
DA (F1)
0V
DB (F2)
0V
Clock
CLK1 (F3)
0V
CLK2 (F4)
0V

Figure 28—1

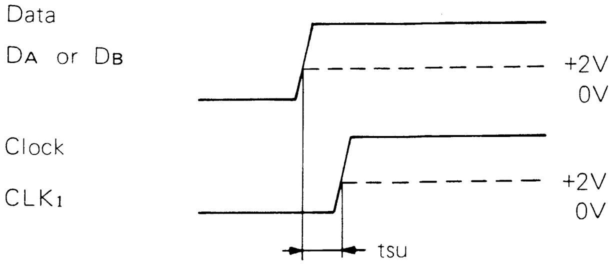

Data
DA or DB
+2V
0V
Clock
CLK1
+2V
0V
tsu

Figure 28—2

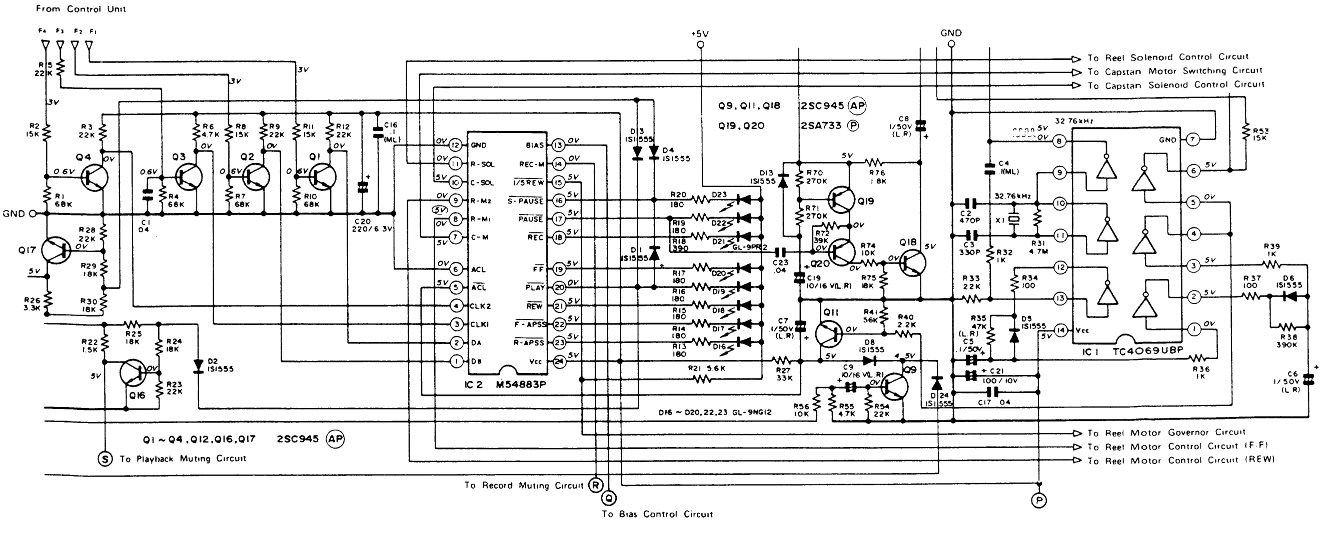

From Control Unit
F4 F3 F2 F1
+5V
GND
To Reel Solenoid Control Circuit
To Capstan Motor Switching Circuit
To Capstan Solenoid Control Circuit
Q9, Q11, Q18 2SC945 (AP)
Q19, Q20 2SA733 (P)
IC2 M54883P
GND
R-SOL
C-SOL
R-M2
R-M1
C-M
ACL
CLK2
CLK1
DA
DB
BIAS
REC-M
T/5REW
S-PAUSE
PAUSE
REC
FF
PLAY
REW
F-APSS
R-APSS
Vcc
IC1 TC4069UBP
32.76kHz
D16 ~ D20,22,23 GL-9NG12
To Reel Motor Governor Circuit
To Reel Motor Control Circuit (FF)
To Reel Motor Control Circuit (REW)
Q1 ~ Q4, Q12, Q16, Q17 2SC945 (AP)
S To Playback Muting Circuit
To Record Muting Circuit R
Q
To Bias Control Circuit
P

Figure 28—3

3. In the case the optional timer AD-200T (H, B, S or D) is connected with the tape deck by means of a 4-pin 360° cable:
   Even when the power switch of the tape deck is kept turned off, a power from the timer, if in connection, is still applied to collectors of the transistors (Q1 thru Q4) inside the 3V–to–5V interface. This helps prevent such a possibility that when AC power is produced in the tape deck together with the timer's power switch turned on, noises will be caused to make the instruction decoder (IC2) operate erratically.
   In other words, when the power switch of the timer is turned on, a clock pulse (CLK_1) as in Fig. 29–1 is caused and it acts on the shift register to clear all the previously set conditions of it; simultaneously, an auto clear pulse ($\overline{\text{ACL}}$) is also caused to clear the preset conditions of the latch circuit inside the instruction decoder (IC2).
   As the power switch of the timer is turned on, the differentiation circuit formed by electrolytic capacitor (C9) and resistor (R54) gets active, so the transistor (Q9) gets turned on, although for a very short period of time. Thus, as the potential at the collector of the transistor (Q9) decreases, so does the potential at the transistor (Q3) across the diode (D24), so that this transistor (Q3) is turned off: as long as the turn-on of transistor (Q9) lasts, the clock signal (CLK_1) keeps on "High" level instead of the previous "Low" level. On the other hand, the auto clear signal ($\overline{\text{ACL}}$) which has so far been at "High" level changes to "Low" level and this continues only as long as the transistor (Q9) remains turned on across the diode (D8).

■ OUTPUT SIGNALS OF INSTRUCTION DECODER (IC2)

The output terminal of the instruction decoder (IC2) consists of pins ⑦ thru ⑪, and ⑬ thru ㉓. Out of all, pins ⑦ thru ⑪, ⑬ and ⑭ are the ones that become active (effective) when they are at "High" level; pins ⑮ thru ㉓ do so when they are at "Low" level.

1. The following table 29–1 reveals how these outputs are related to the mechanism modes which will be set up at the tape deck side.
2. Playback muting control signal
   Under playback or auto spacing mode, since the potential at pin ⑳ ($\overline{\text{PLAY}}$) or pin ⑯ ($\overline{\text{S-PAUSE}}$) of the instruction decoder (IC2) goes down to "Low" level, the potential at the base of transistor (Q16) also decreases across the diode (D1 or D2) so this transistor is eventually turned off. At the same time, the potential at the collector of transistor (Q16), in turn, goes to "High level, and it is applied to the base of transistor (Q604) so that this transistor gets turned on.
   And transistors Q606, Q607, Q609 and Q610 turn off to cancel muting.
3. Record muting control signal (REC-M)
   Under record mode, since the potential at pin ⑭ (REC-M) of the instruction decoder (IC2) increases to "High" level, it is supplied to the base of transistor (Q605), so that this transistor gets turned on. At the same moment, the potential at the collector of transistor (Q605), in turn, decreases to "Low" level (0V), so the potentials at the bases of transistors (Q601 to Q602) are all decreased across Zener diode (ZD602); thus, these transistors get turned off to cancel the record muting.

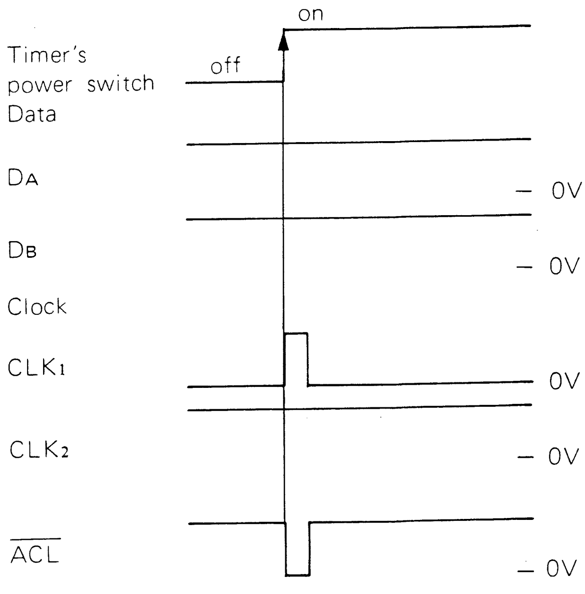


Figure 29–1

4. Record bias on/off control signal (BIAS)
   Under record mode, since the potential at pin ⑬ (BIAS) of the instruction decoder (IC2) increases to "High" level, it is applied to the base of transistor (Q305), so this transistor gets turned on. At the moment, the potential at the collector of transistor (Q305), in turn, decreases to "Low" level (0V) to make the transistor (Q304) turned off.
   Thus, transistor Q303 turns on, and a voltage is applied to the bias oscillation circuit so that it starts operating.
5. Record Plunger Control Signal
   It is the signal to enable operation of the record/ playback switch (SW1).
   In record mode, the potential at pin ⑬ (BIAS) of the instruction detector (IC2) becomes "High" level and the resultant voltage is fed to the base of transistor Q413 comprised in the record plunger drive circuit; thereafter this drive circuit will behave in the same way as the previously said capstan plunger drive circuit. Thus the record plunger (SOL403) is driven to switch over the record/playback switch (SW1).
6. Mechanism indicator (LED) drive output
   Each of the LEDs (D16 thru D23) corresponds to each mechanism mode; when the potential at each of pins ⑯ thru ㉓ of the instruction decoder (IC2) decreases to "Low" level, the corresponding LED can light up.

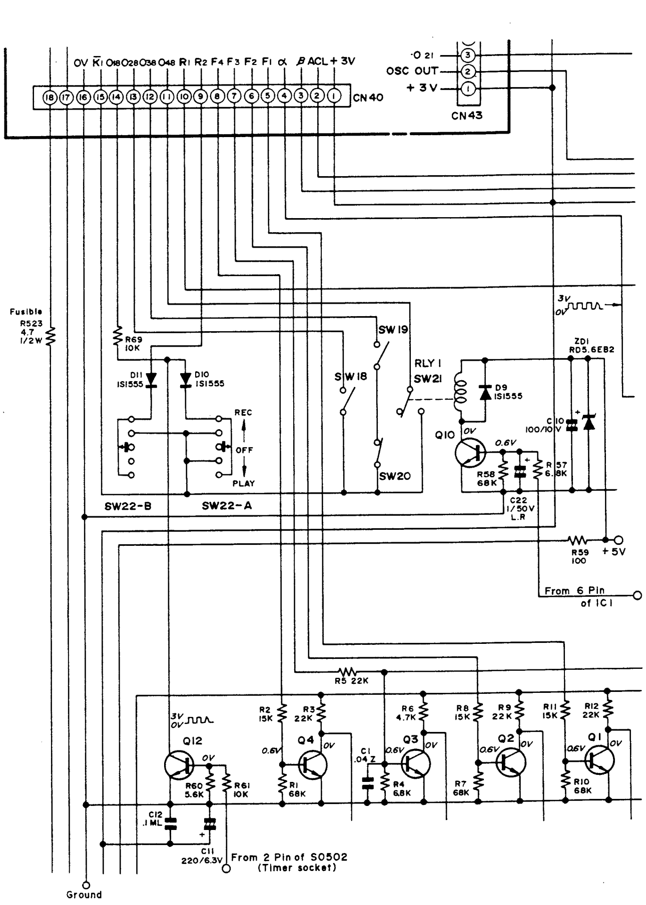
■ TIMER START OPERATION

When the power switch (SW14) of the tape deck is set at "on" position, a timer start instruction is caused and executed in such a way that: the information as to whether the timer switch has been turned on or off is applied to the microprocessor right after the switch SW21 inside the relay (RLY1) is turned on; thus a signal is caused at the output terminal (O_{18}) of the microprocessor, and it is fed via the switch (SW22-A) to the input terminal ($\overline{K1}$) of the microprocessor. In this case, if a signal is, at the same time, caused at the output terminal (R2) of the microprocessor and it is applied to its input terminal ($\overline{K1}$), the tape deck starts playing; if not so, it starts recording.

1. In the case where the optional timer AD-200T (H, B, S or D) or other market-available timer is connected to the tape deck, though without using a 4-pin 360° cable.
   Where the timer standby switch (SW22) has been set at "play" or "record" position in advance, when a power caused by the timer is applied to the tape deck, it instantly starts playing or recording from the very position where it has stopped previously; if a slack of tape is present then, it is eliminated automatically before this starting.
2. In the case where the optional timer AD-200T (H, B, S or D) is connected to the tape deck by means of a 4-pin 360° cable:

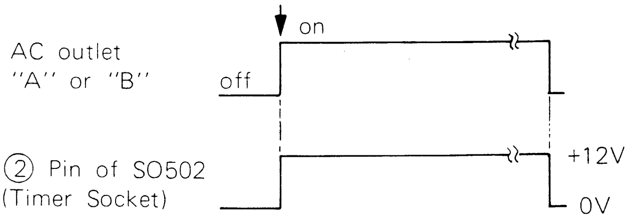
2-1. Where the timer start operation is allowed:
Firstly, where the timer standby switch (SW22) has been set at "play" position in advance, when a power caused by the timer is applied to the tape deck, it instantly start rewinding until the tape reaches an end, and only after that, it assumes playing (in this case, if the APMS or tape counter memory has been left alive, this is given priority over that playing, however).
Next, where the timer standby switch (SW22) has been set at "record" position in advance, the tape deck starts recording from the very position where it has stopped previously.
In either case, if a slack of tape exists then, it is automatically removed; only after this, the tape deck starts the respective operations – the slack is liable to occur if a tape is put in the cassette holder while the switch of the timer is kept turned off.

2-2. Where the timer start operation is not allowed:
The tape deck employs such a circuitry design that it doesn't get ready to perform the timer start operation if the AC outlet switch "A" or "B" of the optional timer AD-200T (H, B, S or D) is set at "on" position. From Fig. 30–2, it follows that when the AC outlet switch "A" or "B" is set at "on" position, AC power as well as DC power (approx. 12V) is supplied to pin ② of the timer socket (SO502), and then they are applied to the base of transistor (Q12), so that this transistor gets turned on.
As a result, the potential at the collector of transistor (Q12) goes down to "Low" level, so a signal caused at the output terminal (O_{18}) of the microprocessor no longer enters its input terminal ($\overline{K1}$); with this, regardless of whether the timer standby switch (SW22) has been set at "play" or "record" position, the microprocessor operates as if the timer standby switch were set at "off" position, thereby causing no timer start operation.



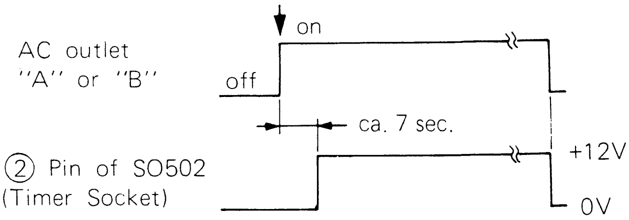
0V K1 O18 O28 O38 O48 R1 R2 F4 F3 F2 F1 α ACL +3V
CN40
O 21
OSC OUT
+3V
CN43
Fusible R523 4.7 1/2W
R69 10K
D11 1S1555
D10 1S1555
REC
OFF
PLAY
SW22-B
SW22-A
SW19
SW18
SW20
RLY1 SW21
D9 1S1555
Q10
0.6V
0V
R58 68K
R57 6.8K
C10 100/10V
C22 1/50V L.R
ZD1 RD5.6EB2
3V
R59 100
+5V
From 6 Pin of IC1
R5 22K
R2 15K
R3 22K
R6 4.7K
R8 15K
R9 22K
R11 15K
R12 22K
Q12
Q4
Q3
Q2
Q1
C1 .047
R60 5.6K
R61 10K
R1 68K
R4 6.8K
R7 68K
R10 68K
C12 .1ML
C11 220/6.3V
From 2 Pin of SO502 (Timer socket)
Ground

Figure 30–1



on
AC outlet "A" or "B"
off
② Pin of SO502 (Timer Socket)
+12V
0V

Figure 30–2



on
AC outlet "A" or "B"
off
ca. 7 sec.
② Pin of SO502 (Timer Socket)
+12V
0V

Figure 30–3

Fig. 30–3 shows the case where the tape deck is allowed to perform the timer start operation.
Here, the timer's internal circuit causes DC 12V power and applies it to pin ② of the timer socket about 7 seconds later than AC power is supplied: consequently, the microprocessor is allowed to operate during that delayed period of time, thereby causing the tape deck to carry out the timer start operation.

■ ABOUT THE SWITCHES CONCERNED WITH CASSETTE TAPE LOADING & UNLOADING

1. In loading a cassette tape:
   When a cassette tape is put into the cassette holder and the cassette holder is closed, the two switches (SW19 and SW20) get turned on, so a signal is caused at the output terminal (O_{38}) of the microprocessor, then it is applied to its input terminal ($\overline{K1}$); at the time of which the microprocessor detects the cassette tape has just settled in its holder.
2. In unloading a cassette tape:
   When the cassette eject button is depressed, the switch (SW20) gets turned off to stop the mechanical motion of the tape deck first of all, before causing the cassette holder to open. Employment of this design leads to preventing such a trouble that if the eject button is pushed when the tape deck is still in action (at play/, record mode, etc), the cassette holder or the tape may hit the magnetic heads accidentally.
   Fig. 31–1 illustrates how the cassette loading switch (SW19) and cassette holder switch (SW20) are related to each other and how they behave.
3. Where the tape deck is in record mode:
   Even if the tape deck is placed in record mode, if the included tape is deprived of its erase protection tab, the switch (SW18) remains turned off, so that the tape deck doesn't really start recording.
   On the other hand, the switch (SW18) gets turned on if the cassette tape is provided with the erase protection tab; thus a signal is caused at the output terminal (O_{28}) of the microprocessor and it is applied to its input terminal ($\overline{K1}$), thereby causing the tape deck to be ready to start recording.

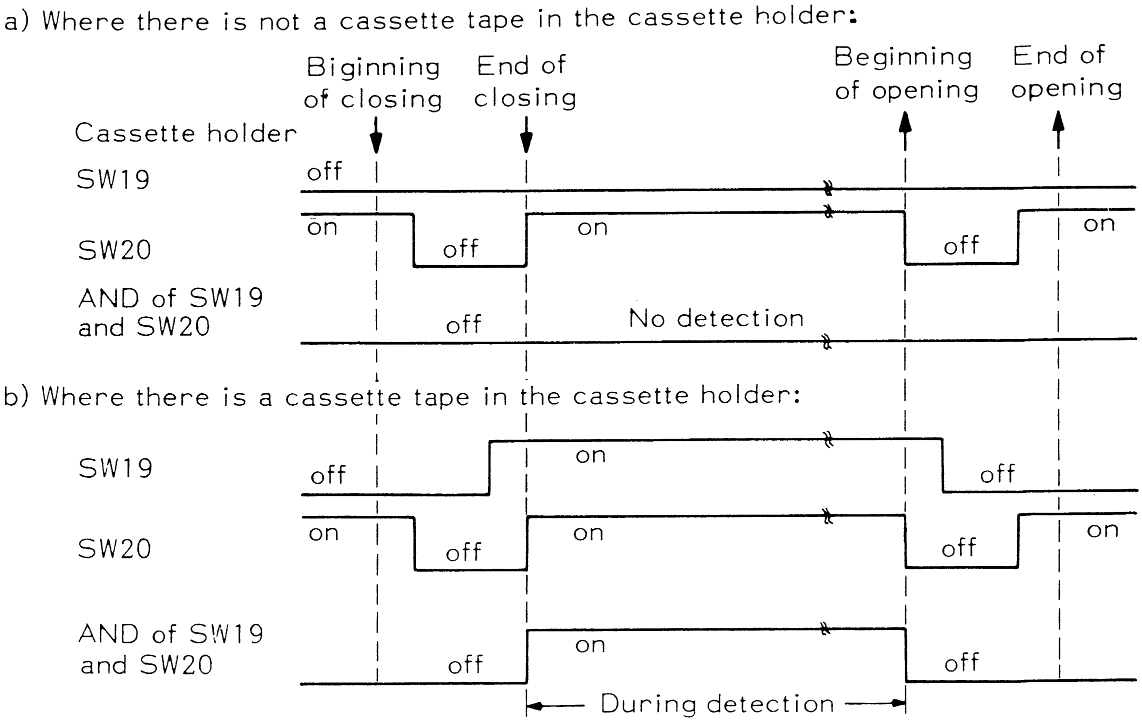

a) Where there is not a cassette tape in the cassette holder:
Biginning of closing
End of closing
Beginning of opening
End of opening
Cassette holder
SW19
off
SW20
on
off
on
off
on
AND of SW19 and SW20
off
No detection
b) Where there is a cassette tape in the cassette holder:
SW19
off
on
off
SW20
on
off
on
off
on
AND of SW19 and SW20
off
on
off
During detection

Figure 31–1

■ BEEP TONE CIRCUIT

Where the beep tone switch (SW23) of the tape deck has been set at "on" position in advance, pushing any of the following buttons – the ones designed to be accompanied by beep tone when pushed – will cause the microprocessor to operate in such a way that at its output terminal (R_1) is produced a signal and it keeps "High" level as long as the said button is being pushed. As a result, the beep tone oscillator circuit (Q13, Q14, Q15) gets conductive to sound the pizoelectric buzzer (BZ1).

- The buttons which are followed by beep tone, when pushed, are:
  Number-input buttons (0 ~ 9), current address button, APMS button, tape counter button, counter-memory buttons (1, 2), direct counter-memory buttons (1, 2), input-clear button, input-set button, APMS skip/check button.

Note:
As for the APMS skip/check button, the beep tone appears only when the tape deck is being in APMS mode, but it doesn't so when the end of APMS-concerned programs is reached.

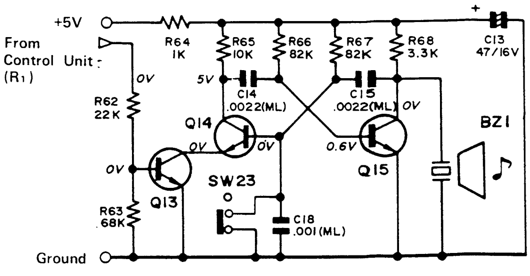

+5V
From Control Unit: (R_1)
R64 1K
R65 10K
R66 82K
R67 82K
R68 3.3K
C13 47/16V
0V
5V
C14 .0022(ML)
C15 .0022(ML)
0V
R62 22K
Q14
0V
0V
0.6V
BZ1
0V
Q15
Q13
SW23
R63 68K
C18 .001(ML)
Ground

Figure 31–2

■ COUNT PULSE GENERATOR CIRCUIT OF TAPE COUNTER [α]

Generation of the count pulses is by rotation of the magnet pulley (designed to rotate synchronizing with the take-up reel of the mechanism) and with the assistance by Hall IC (IC401). There are produced three pulses per every rotation of the magnet pulley, and they are passed on via pin ① of Hall IC (IC401) to the base of transistor (Q7), through which they are level-converted into a 3 V signal entering the input terminal (α) of the microprocessor. Consequently, the microprocessor subjects the incoming signal to 1/5 frequency-division to cause the tape counter to indicate its number.

1. False pulse generator circuit for the prevention of auto stop.

   In the case where the tape deck is operated in combination with the optional timer AD-200T (H, B, S or D) and by means of a 4-pin 360° cable, it may be followed by that when the AC power is supplied to the tape deck, for about three seconds thereafter, none of the counter pulse is applied to the input terminal (α) of the microprocessor if the timer-controlled recording is started; this causes the tape deck to stop automatically.

   The false pulse generator circuit (Q18, Q19, Q20) is intended to prevent this type of auto stop operation and how it produces false pulses is as in Fig. 32–1.

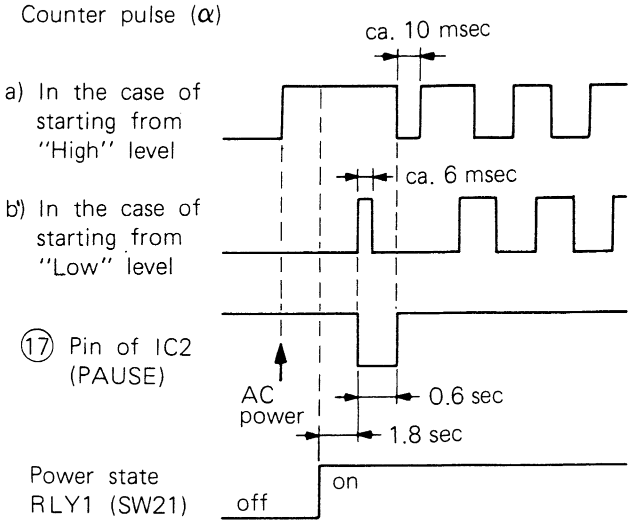


Figure 32–1

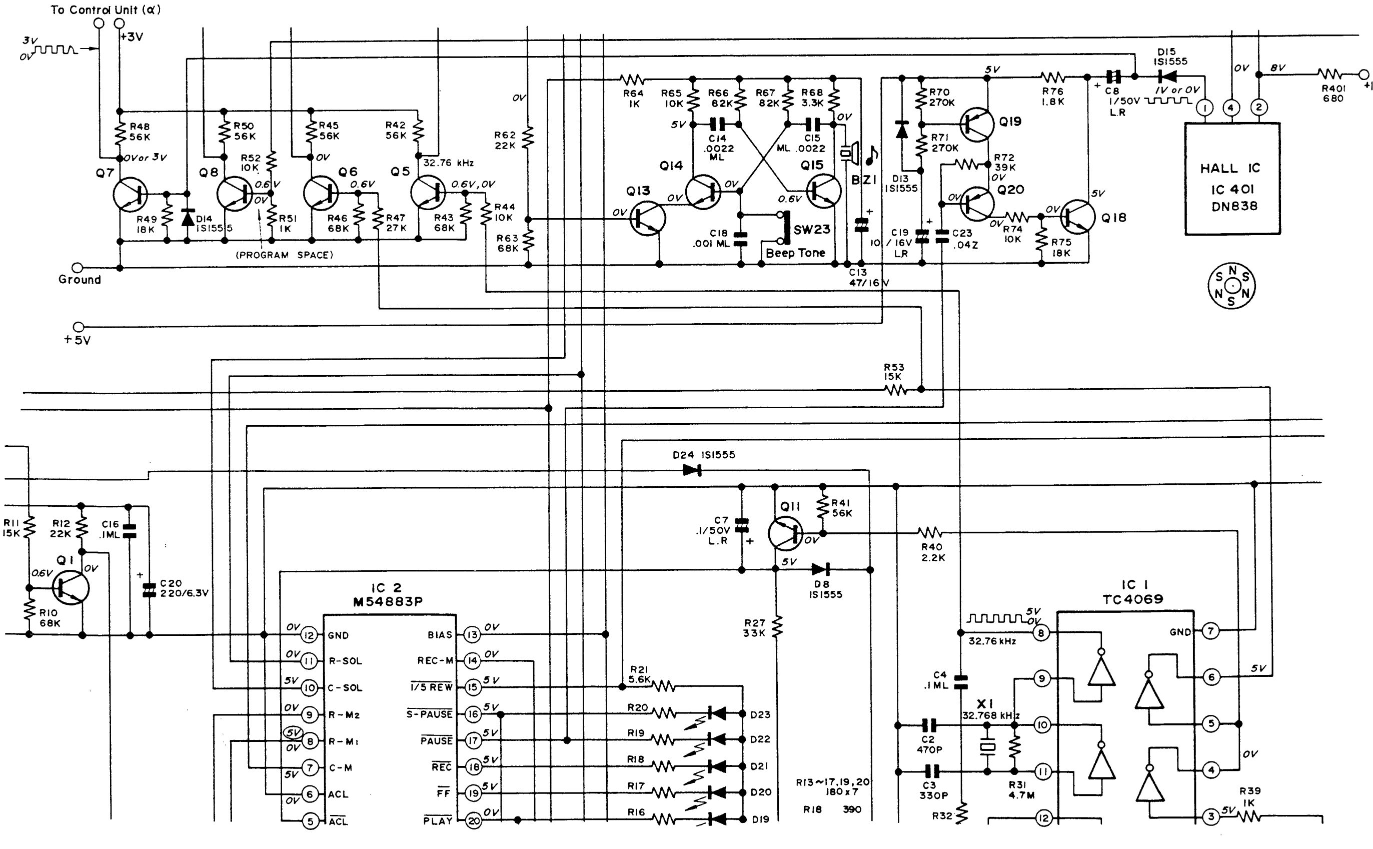

To Control Unit (α)
+3V
Ground
+5V
R48 56K
R50 56K
R45 56K
R42 56K
R52 10K
Q7
Q8
Q6
Q5
R49 18K
D14 1S1555
R51 1K
R46 68K
R47 27K
R43 68K
R44 10K
(PROGRAM SPACE)
32.76 kHz
R62 22K
R63 68K
R64 1K
R65 10K
R66 82K
R67 82K
R68 3.3K
C14 .0022 ML
C15 ML .0022
Q13
Q14
Q15
C18 .001 ML
SW23
Beep Tone
BZ1
C13 47/16V
D13 1S1555
R70 270K
R71 270K
Q19
R72 39K
Q20
R74 10K
R75 18K
Q18
C19 10/16V LR
C23 .04Z
R76 1.8K
C8 1/50V LR
D15 1S1555
R401 680
+12V
HALL IC
IC 401
DN838
R53 15K
D24 1S1555
Q11
R41 56K
C7 .1/50V L.R
D8 1S1555
R40 2.2K
R27 33K
R11 15K
R12 22K
C16 .1ML
Q1
R10 68K
C20 220/6.3V
IC 2
M54883P
GND
R-SOL
C-SOL
R-M2
R-M1
C-M
ACL
BIAS
REC-M
1/5 REW
S-PAUSE
PAUSE
REC
FF
PLAY
R21 5.6K
R20
R19
R18
R17
R16
D23
D22
D21
D20
D19
R13~17,19,20 180x7
R18 390
IC 1
TC4069
32.768 kHz
C4 .1ML
X1 32.768 kHz
C2 470P
C3 330P
R31 4.7M
R32
R39 1K
GND

Figure 32–2

■ APSS/APMS PROGRAM-TO-PROGRAM SPACE SIGNAL DETECTOR CIRCUIT (β)

The model RT-7100/HB employs the APMS in addition to the APSS (or APLD) already much familiar to the users, and their difference consists in that: the conventional APSS suffices only if it detects non-recorded parts of a tape during its fast forward mode alone, while in the new APMS it is needed to detect such non-recorded parts not only during fast forward mode but during playback mode as well. Although similar in basic principle to the conventional APSS circuit, it is in this APSS/APMS circuit that the discharge switch (SW12) is used to maintain the input signal's gain in playback mode as it is by changing the time constant of the discharge circuit according to whether the unit is engaged in playback mode or fast forward mode (APSS forward or reverse).

The discharge switch is electrically interlocked with the sub-chassis of the mechanical unit so that it turns off in playback mode and turns on in APSS forward (or reverse) mode.

How the APSS/APMS circuit behaves is as follows:

In playback mode, the potential at pin ⑳ ($\overline{\text{PLAY}}$) of the instruction detector (IC2) becomes "Low" level; "High" level potential of transistor Q16 enters the bases of transistors Q702 and Q704 so that both transistors are turned on; with Q702 turned on, transistor Q703 turns off to remove the muting so far existent; while with Q704 turned on, transistor Q705 turns off to permit the signal coming from the record/playback head to arrive at the APSS amplifier (Q706, Q707) without reducing its gain at all; output of the APSS amplifier is rectified by transistor Q708 to charge electrolytic capacitor C705; at the time, it is in the level comparator circuit (made of transistors Q709 and Q710) that Q709 turns on while Q710 turns off (these transistors also make up a schmidt trigger circuit). However, if the program-to-program space (non-recorded part) is reached then, the incoming signal discontinues to turn off the discharge switch (SW12), so that the charge-laden electrolytic capacitor C705 discharges across resistor R718, which results in that the time constant for detection of the recorded part becomes longer; transistor Q709 turns off while transistor Q710 turns on.

In APSS forward (or reverse) mode, the potential at pin ⑪ (R-SOL) of the instruction detector (IC2) becomes "High" level; transistor Q701 turns on while transistor Q703 turns off to remove the muting so far existent; in contrast with playback mode, the potential at pin ⑳ ($\overline{\text{PLAY}}$) of the instruction detector becomes "High" level to turn on transistor Q16; as a result, transistor Q704 turns off while transistor Q705 turns on so that the signal coming from the record/playback head reaches the APSS amplifier (Q706, Q707) while its gain is reduced properly; output of the APSS amplifier charges the electrolytic capacitor C705 across resistor R714 since the discharge switch (SW12) has been turned on at that time. However, if the program-to-program space (non-recorded part) is reached then, the charge-laden electrolytic capacitor C705 discharges across the discharge switch (SW12) and resistor R713, so that the time constant for detection of the recorded part becomes shorter; transistor Q709 turns off while transistor Q710 turns on.

Whether the unit is in playback mode or in APSS forward (or reverse) mode, output of the level comparator circuit (Q709, Q710) reaches as square wave into the base of transistor Q8 where it is transformed into 3 V signal which is considered a program-to-program pulse signal; at the time, the potential at collector of Q8 rises to "High" level for the non-recorded part while it falls to "Low" level for the recorded part. This pulse signal then enters the input terminal (β) of the microprocessor so that it controls APMS or APSS operation.

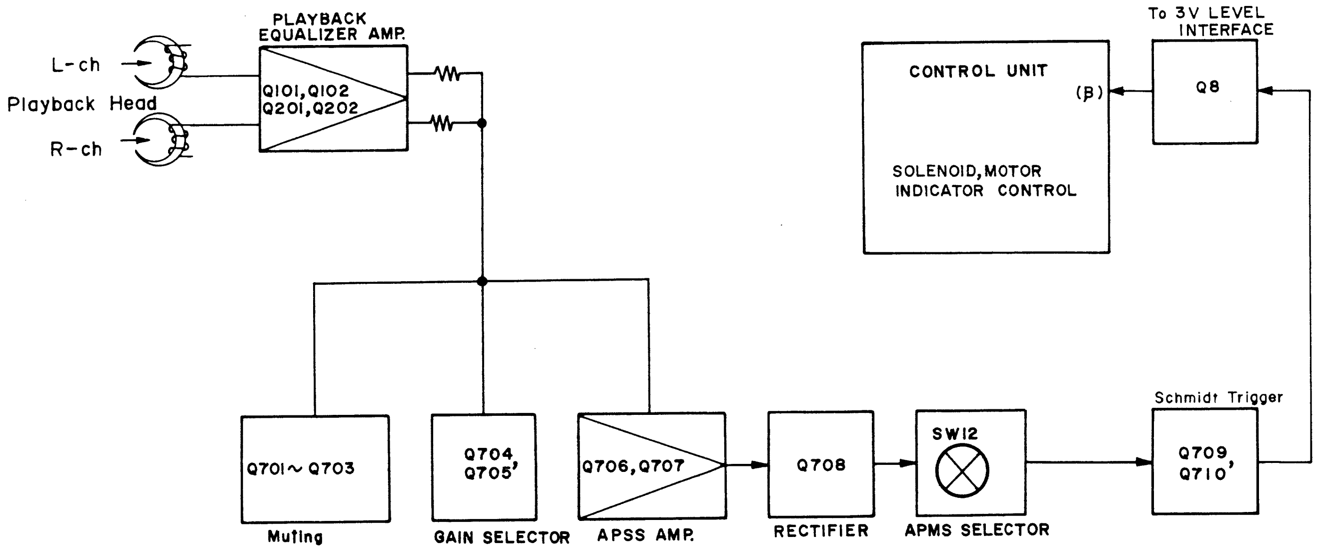

L-ch
Playback Head
R-ch
PLAYBACK EQUALIZER AMP.
Q101,Q102
Q201,Q202
CONTROL UNIT
(β)
SOLENOID,MOTOR
INDICATOR CONTROL
To 3V LEVEL INTERFACE
Q8
Schmidt Trigger
Q701~Q703
Muting
Q704, Q705'
GAIN SELECTOR
Q706,Q707
APSS AMP.
Q708
RECTIFIER
SW12
APMS SELECTOR
Q709, Q710'

Figure 33–1

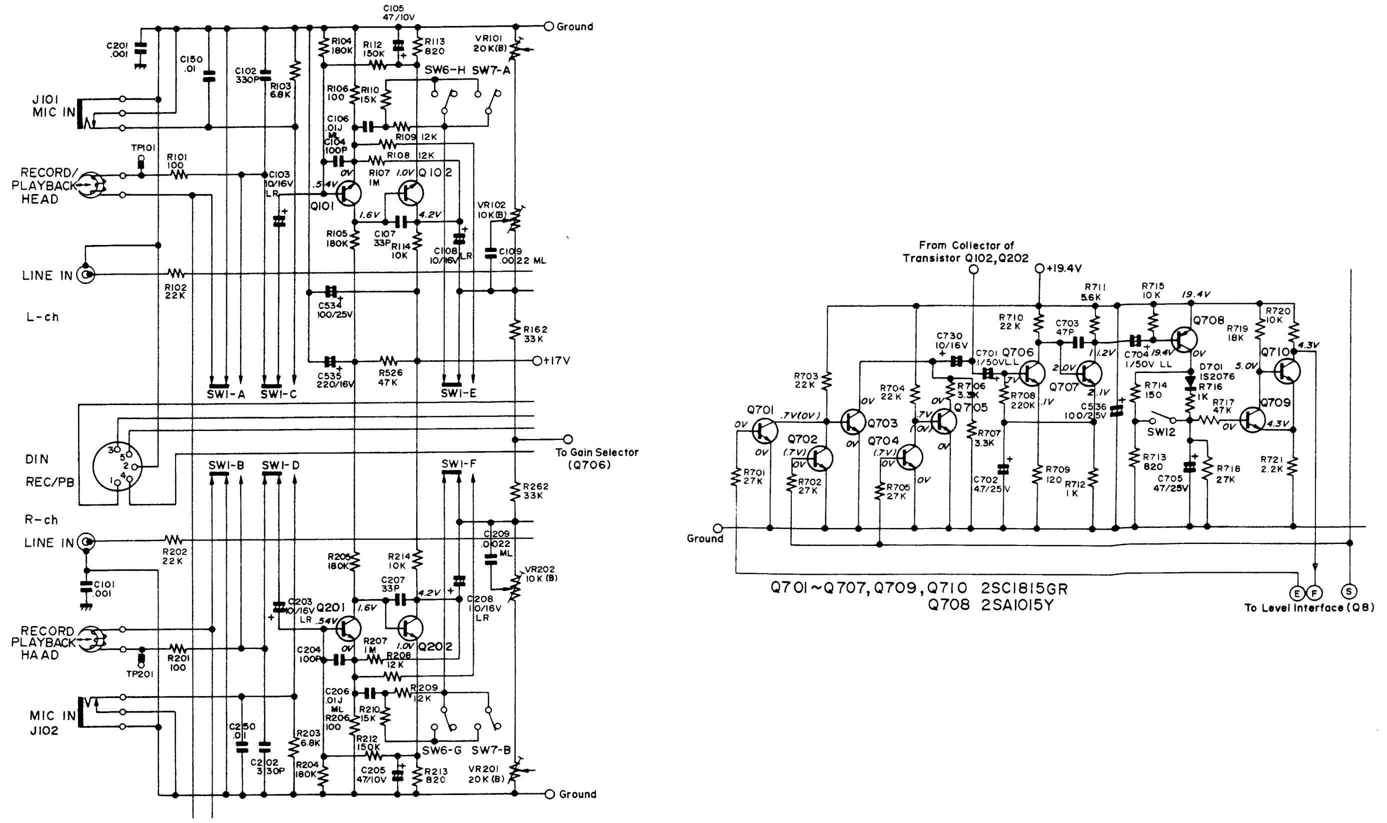

Ground
J101 MIC IN
RECORD/PLAYBACK HEAD
LINE IN
L-ch
DIN REC/PB
R-ch
J102
To Gain Selector (Q706)
From Collector of Transistor Q102,Q202
Q701~Q707,Q709,Q710 2SC1815GR
Q708 2SA1015Y
To Level Interface (Q8)

Figure 34–1

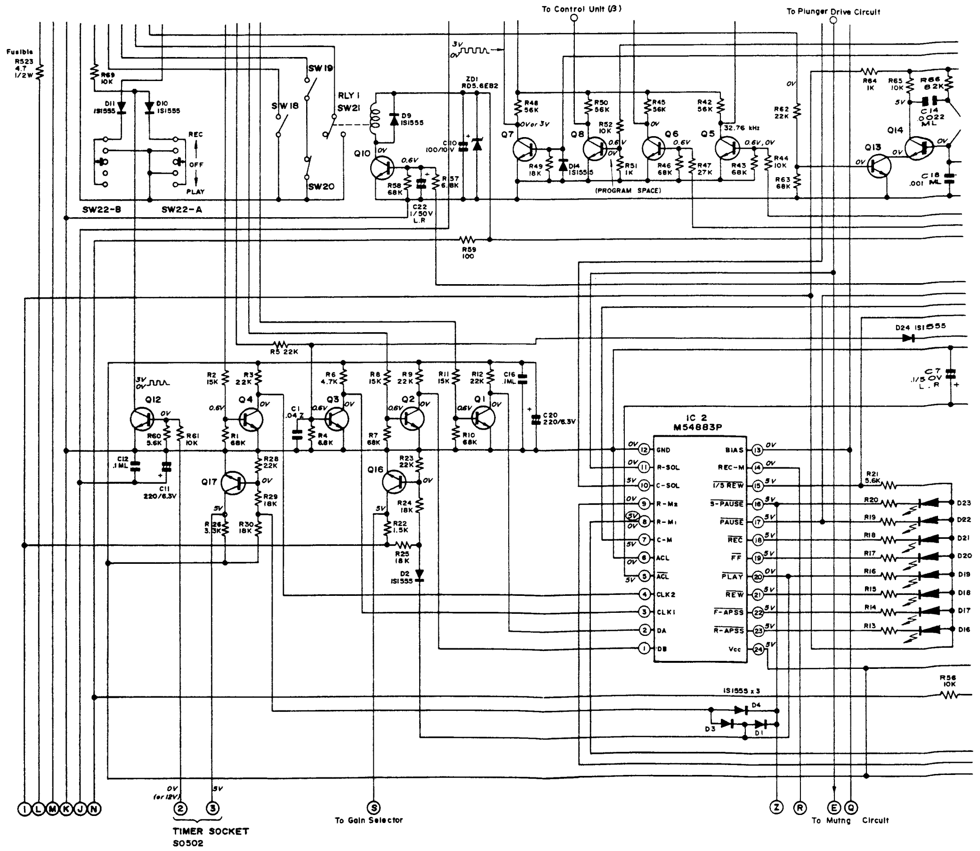

To Control Unit (β)
To Plunger Drive Circuit
IC 2 M54883P
TIMER SOCKET S0302
To Gain Selector
To Muting Circuit

Figure 34–2

2. Timing Chart

Assuming that a tape is situated, for instance, at 2nd program;

And suppose that you have had the memory of the tape deck to skip, for instance, from 1st program to 3rd program at the time of auto play mode:

When the auto play button is depressed, first the tape deck gets in APSS reverse action, through which the tape turns back to 1st program to be played from its beginning. When 1st program reaches its end, and then a space between 1st and 2nd programs is detected, a program-to-program space pulse (β) is produced; now the tape deck, therefore, stops and it gets, in turn, in APSS forward action.

Next, the tape will reach the end of 2nd program and then a space between 2nd and 3rd programs, so that a program-to-program space pulse (β) is again produced; now the tape deck again stops and it performs "1/5 rewind/pause" operation to reach 3rd program and play it back.

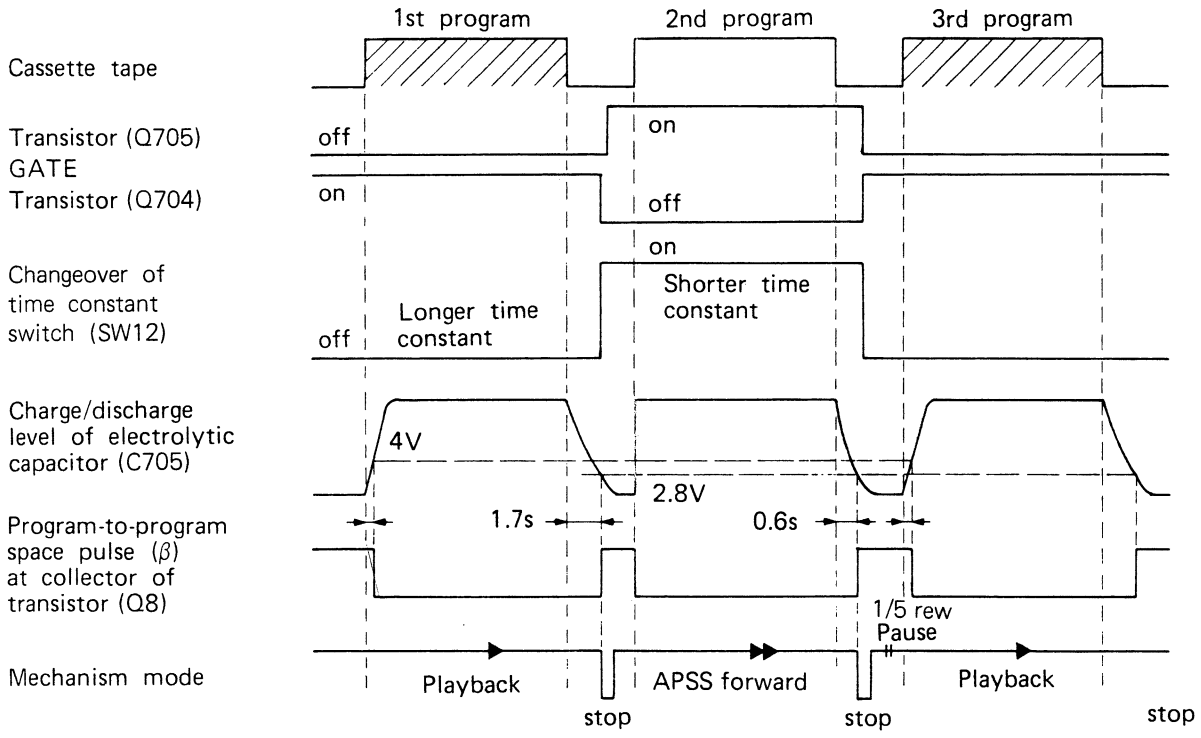


Figure 35–1

* **Plunger Solenoid Drive Circuits**

There are three types of the plunger solenoid drive circuit, say, capstan plunger, reel plunger and record plunger drive circuits and all the three are designed to operate on the same principle, so in the following, let's limit to the explanations about the capstan plunger drive circuit alone and to omit the two other varieties.

- Behaviors of the capstan plunger drive circuit:
  when the potential at pin ⑩ of the instruction detector IC2 becomes "High" level, the potential at the base of transistor Q407 also becomes "High" level for it to get turned on; transistor Q408 turns on so that a current is caused at its collector to run in the base of transistor Q411 for it to be turned on; the potential at the collector of transistor Q411 becomes "Low" level to turn on transistor Q412, so that a voltage (–5 V) is caused at its collector, and it arrives at the capstan plunger (SOL401).
  Meanwhile with transistor Q408 turned on, a current is also caused and it charges the electrolytic capacitor C407 across diode D405; transistor Q409 turns on and the potential at its collector falls to "Low" level to turn on transistor Q410; a voltage (+18 V) is caused at the collector of Q410 and it arrives also at the capstan plunger (SOL401).

Besides the above two voltages (–5 V and +18 V), –17.5 V caused at the emitter of transistor Q411 is also fed to the capstan plunger (SOL401) so that this plunger can operate in this way: +18 V (at the collector of transistor Q410) and –17.5 V (at the emitter of transistor Q411) add together to become 35.5 V and with this, the capstan plunger attracts itself and the attraction keeps on until the electrolytic capacitor C407 has charged up; when the charging ends, a current running in the base of transistor Q409 stops so that this transistor turns off; transistor Q410 also turns off, so a voltage (+18 V) no longer develops at its collector. Accordingly, –5 V (at the collector of transistor Q412) and –17.5 V (at the emitter of Q411) subtract each other to become –12.5 V and with this, the capstan plunger can still hold itself after it has been first initiated with the said voltage 35.5 V. This attraction-hold state goes on until the next new signal has come in.

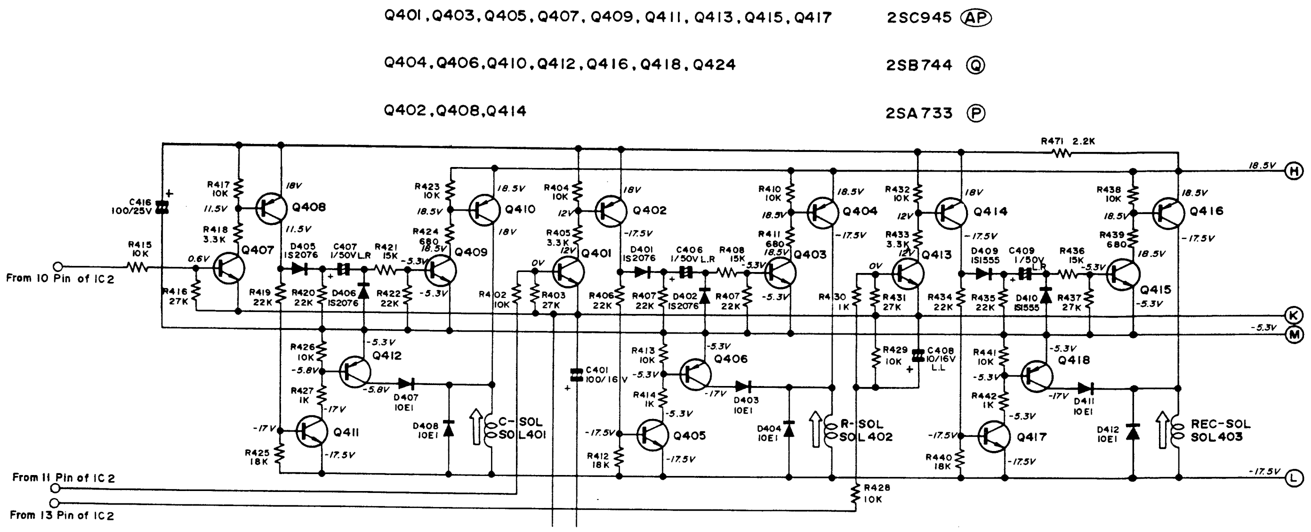
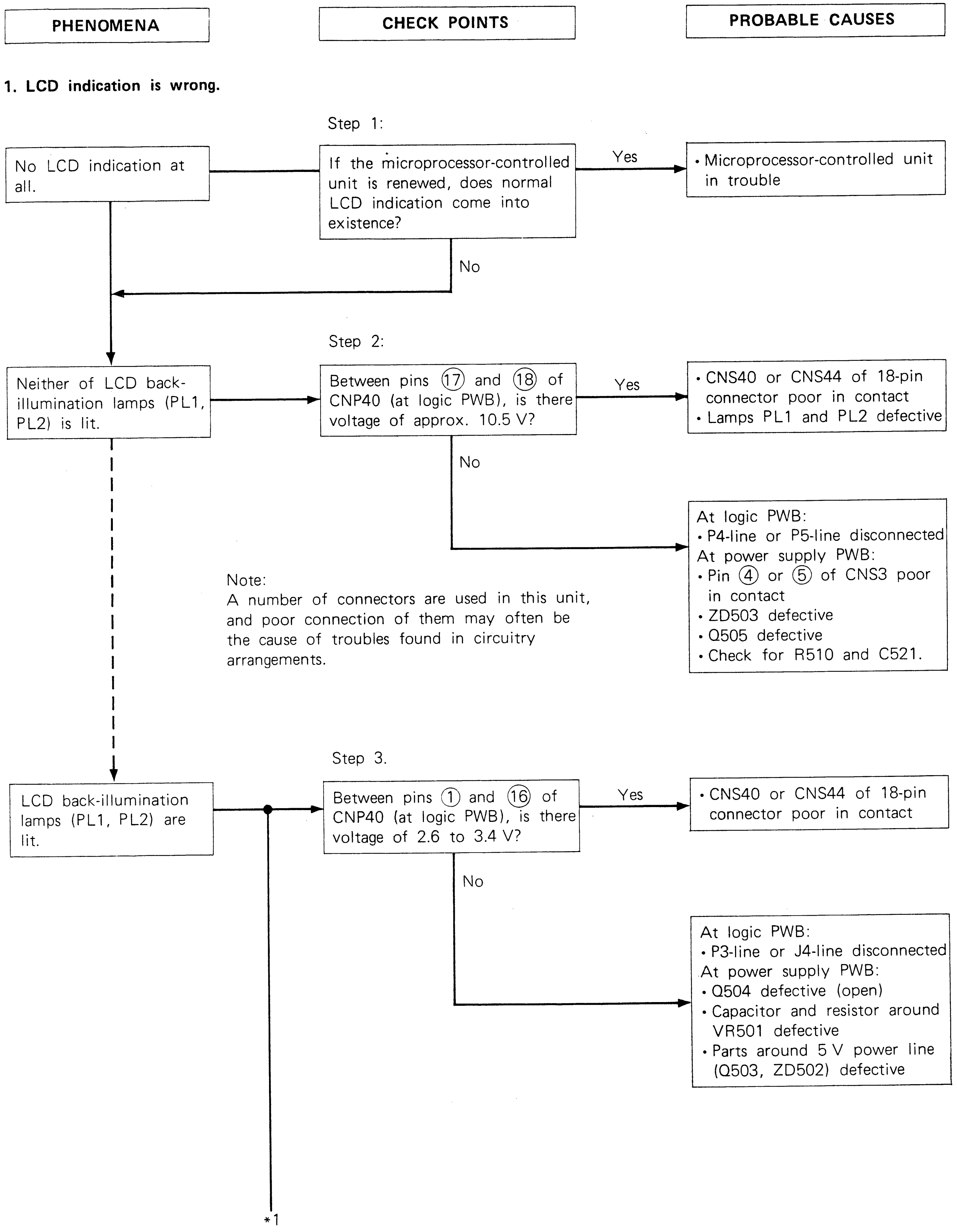
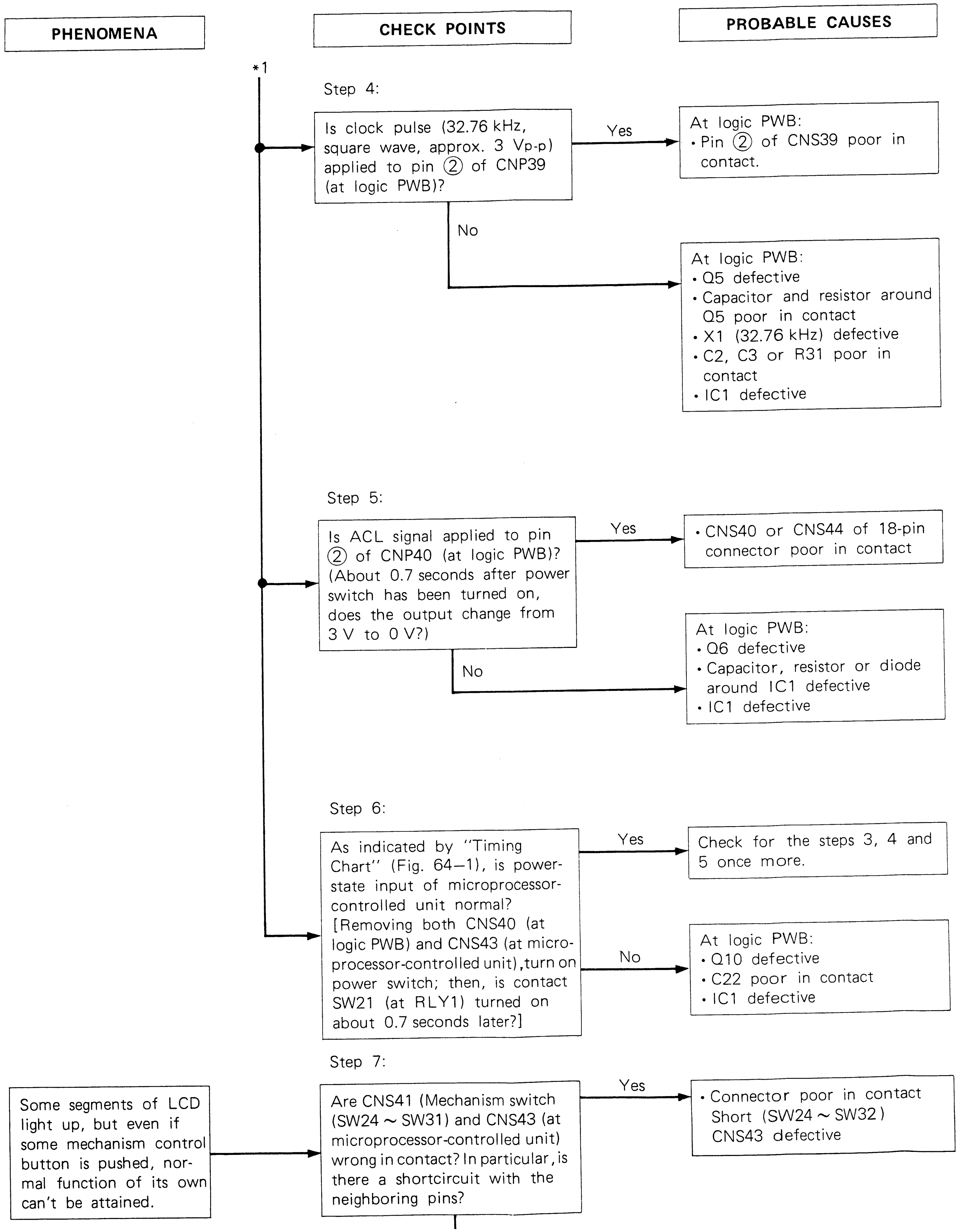

Q401, Q403, Q405, Q407, Q409, Q411, Q413, Q415, Q417 2SC945 (AP)
Q404, Q406, Q410, Q412, Q416, Q418, Q424 2SB744 (Q)
Q402, Q408, Q414 2SA733 (P)
From 10 Pin of IC2
From 11 Pin of IC2
From 13 Pin of IC2
C-SOL
SOL401
R-SOL
SOL402
REC-SOL
SOL403
Q407
Q408
Q409
Q410
Q411
Q412
C407
D405
Ⓗ
Ⓚ
Ⓜ
Ⓛ
18.5V
-5.3V
-17.5V

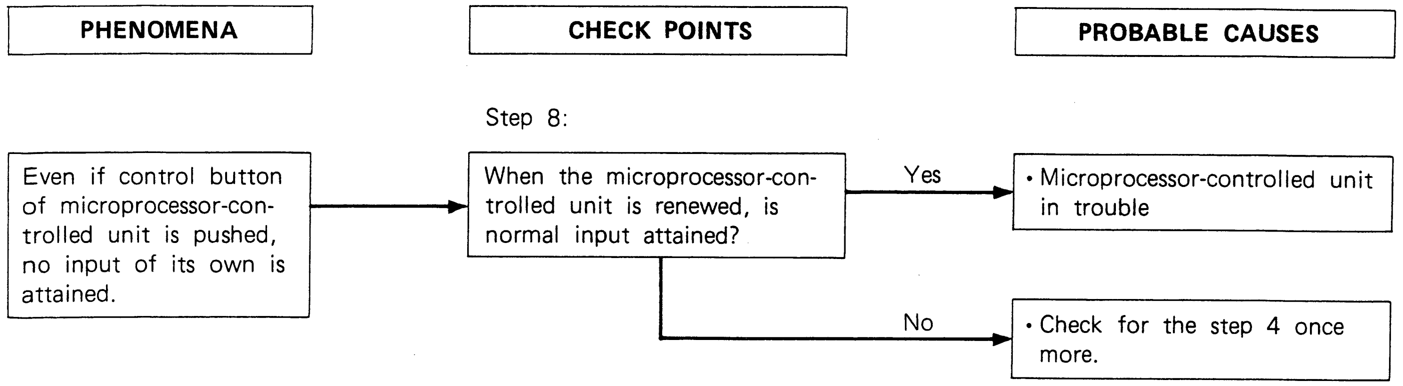
Figure 36–1

TROUBLESHOOTING

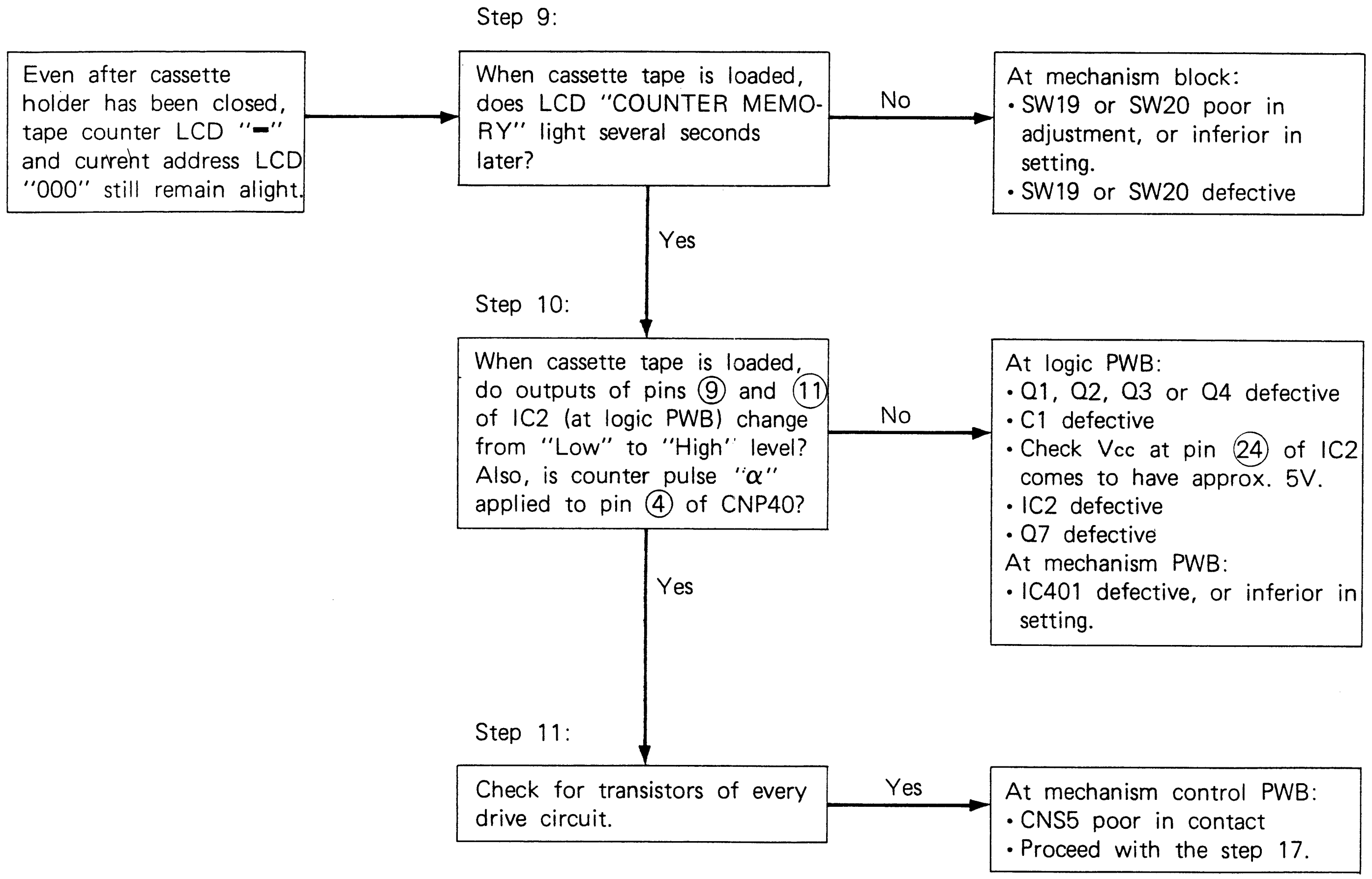

PHENOMENA
CHECK POINTS
PROBABLE CAUSES
1. LCD indication is wrong.
No LCD indication at all.
Step 1:
If the microprocessor-controlled unit is renewed, does normal LCD indication come into existence?
Yes
• Microprocessor-controlled unit in trouble
No
Neither of LCD back-illumination lamps (PL1, PL2) is lit.
Step 2:
Between pins ⑰ and ⑱ of CNP40 (at logic PWB), is there voltage of approx. 10.5 V?
Yes
• CNS40 or CNS44 of 18-pin connector poor in contact
• Lamps PL1 and PL2 defective
No
At logic PWB:
• P4-line or P5-line disconnected
At power supply PWB:
• Pin ④ or ⑤ of CNS3 poor in contact
• ZD503 defective
• Q505 defective
• Check for R510 and C521.
LCD back-illumination lamps (PL1, PL2) are lit.
Step 3.
Between pins ① and ⑯ of CNP40 (at logic PWB), is there voltage of 2.6 to 3.4 V?
Yes
• CNS40 or CNS44 of 18-pin connector poor in contact
No
At logic PWB:
• P3-line or J4-line disconnected
At power supply PWB:
• Q504 defective (open)
• Capacitor and resistor around VR501 defective
• Parts around 5 V power line (Q503, ZD502) defective
*1

Note:
A number of connectors are used in this unit, and poor connection of them may often be the cause of troubles found in circuitry arrangements.

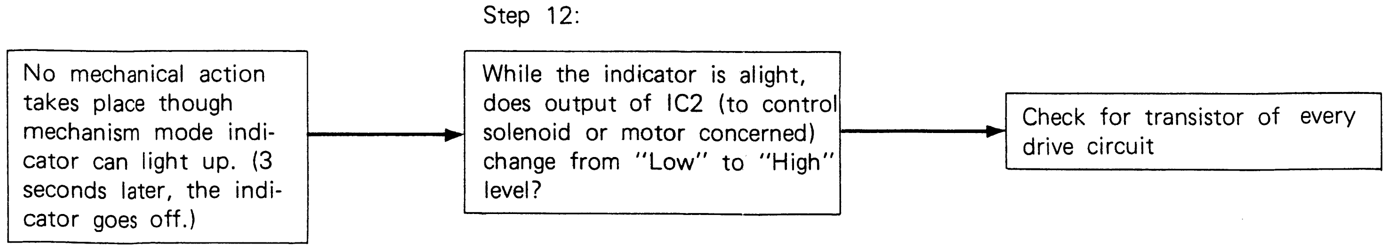

PHENOMENA
CHECK POINTS
PROBABLE CAUSES
*1
Step 4:
Is clock pulse (32.76 kHz, square wave, approx. 3 Vp-p) applied to pin ② of CNP39 (at logic PWB)?
Yes
At logic PWB:
• Pin ② of CNS39 poor in contact.
No
At logic PWB:
• Q5 defective
• Capacitor and resistor around Q5 poor in contact
• X1 (32.76 kHz) defective
• C2, C3 or R31 poor in contact
• IC1 defective
Step 5:
Is ACL signal applied to pin ② of CNP40 (at logic PWB)? (About 0.7 seconds after power switch has been turned on, does the output change from 3 V to 0 V?)
Yes
• CNS40 or CNS44 of 18-pin connector poor in contact
No
At logic PWB:
• Q6 defective
• Capacitor, resistor or diode around IC1 defective
• IC1 defective
Step 6:
As indicated by "Timing Chart" (Fig. 64–1), is power-state input of microprocessor-controlled unit normal? [Removing both CNS40 (at logic PWB) and CNS43 (at microprocessor-controlled unit), turn on power switch; then, is contact SW21 (at RLY1) turned on about 0.7 seconds later?]
Yes
Check for the steps 3, 4 and 5 once more.
No
At logic PWB:
• Q10 defective
• C22 poor in contact
• IC1 defective
Step 7:
Some segments of LCD light up, but even if some mechanism control button is pushed, normal function of its own can't be attained.
Are CNS41 (Mechanism switch (SW24 ~ SW31) and CNS43 (at microprocessor-controlled unit) wrong in contact? In particular, is there a shortcircuit with the neighboring pins?
Yes
• Connector poor in contact
Short (SW24 ~ SW32)
CNS43 defective

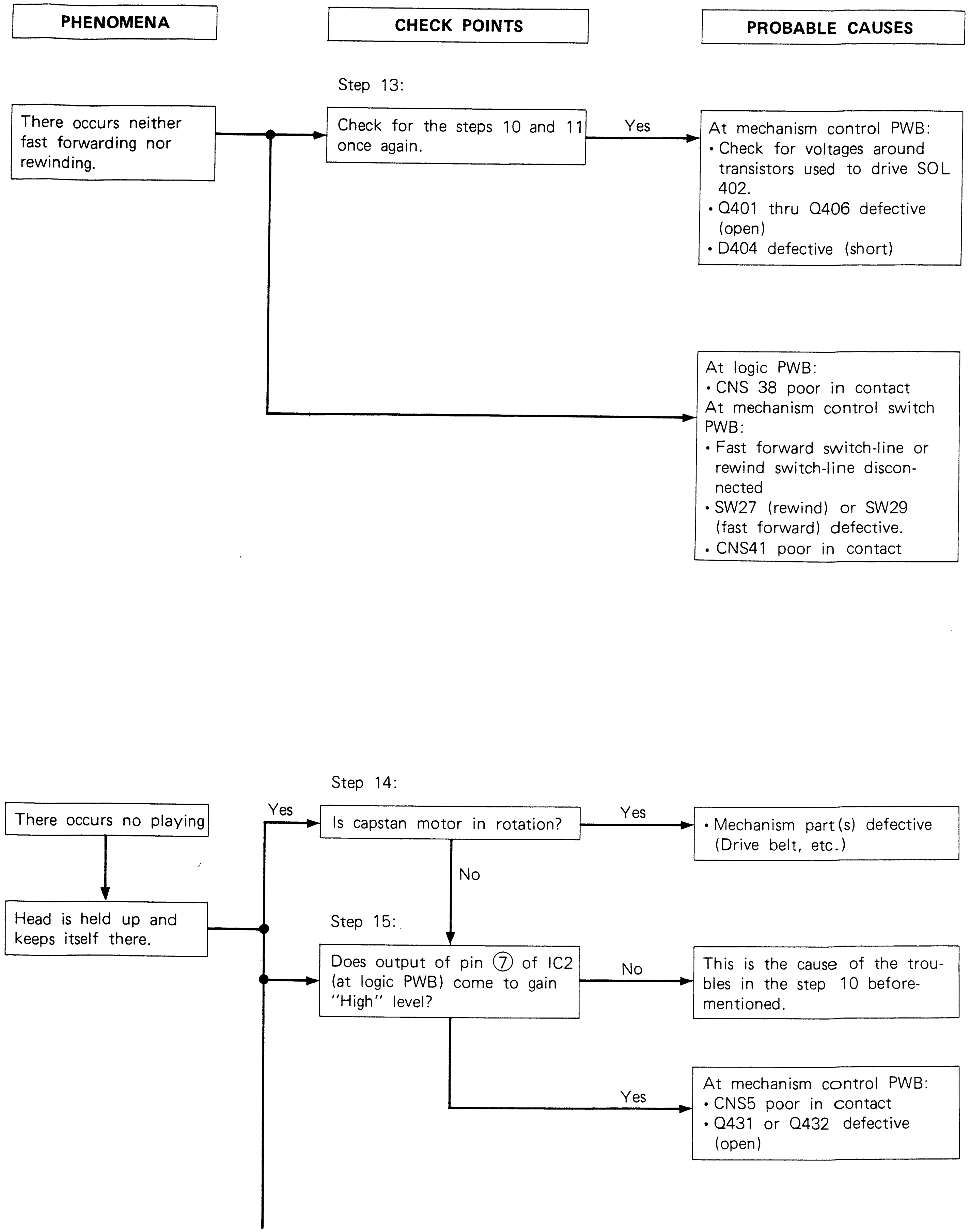

PHENOMENA
CHECK POINTS
PROBABLE CAUSES
Step 8:
Even if control button of microprocessor-controlled unit is pushed, no input of its own is attained.
When the microprocessor-controlled unit is renewed, is normal input attained?
Yes
• Microprocessor-controlled unit in trouble
No
• Check for the step 4 once more.

2. Even when cassette tape is loaded, automatic tape-tension device doesn't start.


Step 9:
Even after cassette holder has been closed, tape counter LCD "–" and current address LCD "000" still remain alight.
When cassette tape is loaded, does LCD "COUNTER MEMORY" light several seconds later?
No
At mechanism block:
• SW19 or SW20 poor in adjustment, or inferior in setting.
• SW19 or SW20 defective
Yes
Step 10:
When cassette tape is loaded, do outputs of pins ⑨ and ⑪ of IC2 (at logic PWB) change from "Low" to "High" level? Also, is counter pulse "α" applied to pin ④ of CNP40?
No
At logic PWB:
• Q1, Q2, Q3 or Q4 defective
• C1 defective
• Check Vcc at pin ㉔ of IC2 comes to have approx. 5V.
• IC2 defective
• Q7 defective
At mechanism PWB:
• IC401 defective, or inferior in setting.
Yes
Step 11:
Check for transistors of every drive circuit.
Yes
At mechanism control PWB:
• CNS5 poor in contact
• Proceed with the step 17.

3. Even when mechanism manual control button is pushed, no mechanical action occurs.


Step 12:
No mechanical action takes place though mechanism mode indicator can light up. (3 seconds later, the indicator goes off.)
While the indicator is alight, does output of IC2 (to control solenoid or motor concerned) change from "Low" to "High" level?
Check for transistor of every drive circuit


PHENOMENA
CHECK POINTS
PROBABLE CAUSES
Step 13:
There occurs neither fast forwarding nor rewinding.
Check for the steps 10 and 11 once again.
Yes
At mechanism control PWB:
• Check for voltages around transistors used to drive SOL 402.
• Q401 thru Q406 defective (open)
• D404 defective (short)
At logic PWB:
• CNS 38 poor in contact
At mechanism control switch PWB:
• Fast forward switch-line or rewind switch-line disconnected
• SW27 (rewind) or SW29 (fast forward) defective.
• CNS41 poor in contact
Step 14:
There occurs no playing
Head is held up and keeps itself there.
Yes
Is capstan motor in rotation?
Yes
• Mechanism part(s) defective (Drive belt, etc.)
No
Step 15:
Does output of pin ⑦ of IC2 (at logic PWB) come to gain "High" level?
No
This is the cause of the troubles in the step 10 before-mentioned.
Yes
At mechanism control PWB:
• CNS5 poor in contact
• Q431 or Q432 defective (open)

PHENOMENA	CHECK POINTS	PROBABLE CAUSES
*2	Step 16: No → Does output of pin ⑩ of IC2 (at logic PWB) come to gain "High" level?	At mechanism control PWB: • CNS5 poor in contact • Check for voltages around transistors used to drive SOL401. • Q407 thru Q412 defective (open) • D408 defective (short)
Nor does mechanism mode indicator light up.	Step 17:	At mechanism control switch PWB: • SW24 thru SW32 defective • Parts around the switches poor in contact At mechanism control switch PWB: • LED16 thru LED23 defective At logic PWB: • IC2 defective

4. As the result of automatic tape-tension device operating or at the time of APMS mode, cassette tape becomes wrong in position.

PHENOMENA	CHECK POINTS	PROBABLE CAUSES
As the result of automatic tape-tension device operating or at the time of APMS mode, tape speed at "1/5 rewind" mode grows faster than normal (that is, the same as that at fast forward or rewind mode).	Step 18: At "1/5 rewind" mode, does output of pin ⑮ of IC2 (at logic PWB) come to obtain "Low" level?	No → At logic PWB: • R21 poor in contact • IC2 defective
	Yes	At mechanism control PWB • Q419 or Q420 defective (short) • Parts around Q419 defective (short)

5. Tape speed is faster or slower than normal at fast forward or rewind mode.

PHENOMENA	CHECK POINTS	PROBABLE CAUSES
Tape speed is too fast at fast forward or rewind mode.	Step 19:	At mechanism control PWB: • Q422 thru Q424 defective (short) • Q421 defective (open) • VR401 poor in contact
Tape speed is too slow at fast forward or rewind mode.	Step 20: At fast forward or rewind mode, does output of pin ⑮ (1/5 REW) of IC2 (at logic PWB) come to obtain "High" level?	No → At logic PWB: • R21 poor in contact • IC2 defective
	Yes	At mechanism control PWB • Q419 or Q420 defective (open) • Q421 defective (short) • Mechanism defective

6. Beep tone continues to give off even without pushing control button of microprocessor-controlled unit.

PHENOMENA	CHECK POINTS	PROBABLE CAUSES
Beep tone ceases when beep tone switch is turned off.	Step 21: When no control button is being pushed, does output of pin ⑩ (R1) of CNP40 (at logic PWB) remain at "Low" level (0 V)?	No → Microprocessor-controlled unit in trouble
	Yes	At logic PWB: • Q13 defective (short)
Beep tone never ceases even if beep tone switch is turned off.	Step 22:	• Parts around beep tone switch (SW23) disconnected.

7. Timer start doesn't occur.

PHENOMENA	CHECK POINTS	PROBABLE CAUSES
	Step 23: Check whether or not timer standby switch (SW22) is poor in contact.	At logic PWB: Q9 shall turn on right after AC power is fed. • Q9 defective • D24 defective (open)

PHENOMENA **CHECK POINTS** **PROBABLE CAUSES**

8. APSS/APMS doesn't operate in normal way.

Step 24:

APSS/APMS operation goes often erratical.

Is space-to-space pulse (β) applied to pin ③ of CNP40 (at logic PWB)? (With program recorded: "Low" level, without program recorded: "High" level)

Yes

- Microprocessor-controlled unit in trouble
- CNS40 or CNS44 of 18-pin connector poor in contact

No

Referring to the foregoing text "APSS/APMS Program-to-Program Space Signal Detector Circuit [β]", check for every circuit concerned.

- APMS detector circuit in trouble
- Time constant circuit in trouble
- Connectors poor in contact

9. Time counter of optional timer (AD-200T) doesn't synchronize with operation of the tape deck.

Step 25:

Even if pause button is pushed during playing or recording, time counter still continues to advance (provided synchro switch of the timer is set at "on").

At pause mode, does output of pin ③ of timer socket (SO502) come to gain "Low" level? (This check must be made by removing 4-pin 360° cable.)

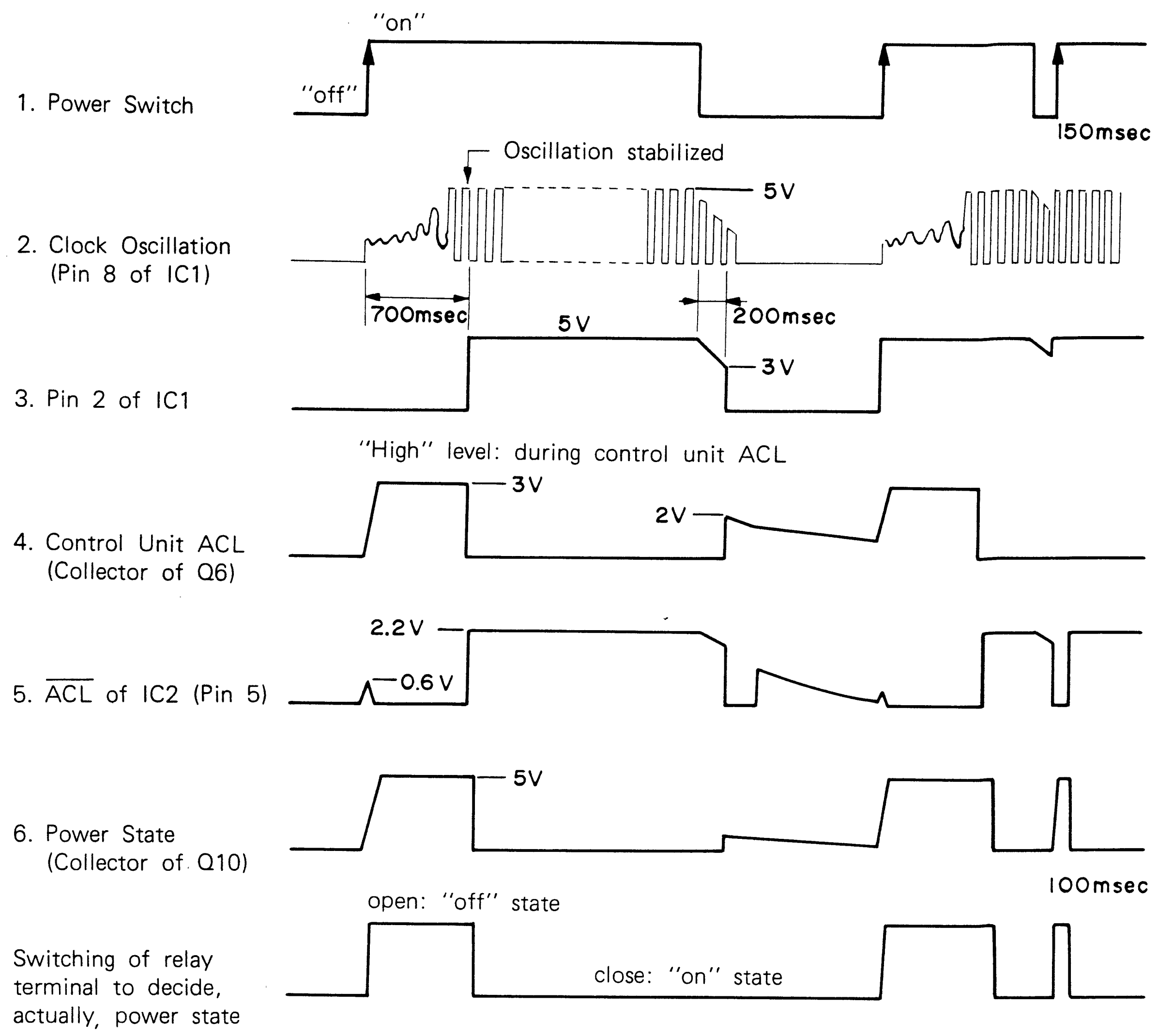
Yes

At optional timer (AD-200T): →Refer to Service Manual of AD-200TH, TB, TS and TD.

No

At logic PWB:

- Q16 defective (open)
- D3 or D4 defective (short)



Ⓐ :
When the optional timer AD-200T (H, B, S or D) is connected to the RT-7100H/HB, this sets up back-up voltages 5 V (to be applied to clock oscillator IC1) and 3 V (to be applied to control unit). However, the timing 2 of clock oscillation shown in the above diagram is such that it is not given the said back-up voltage.

Figure 44–1 TIMING CHART

Output of Instruction Decoder (IC2)	Pin No.	No.	0	2	6	1	5	7	3	A	4	B	8	9	C	D	Actions of every drive circuit
		Mechanism Mode	Stop	Play/ Pause	Record /Pause	Play	Record /Play	Auto Spacing	Fast Forward	1/5 Fast Forward	Rewind	1/5 Rewind	APSS Forward	APSS Reverse	Play Muting	Record /Play Muting	
Output for the mechanism control section	7	Capstan Motor	Low	(High)	(High)	(High)	(High)	(High)	Low	Low	Low	Low	Low	Low	(High)	(High)	The capstan motor (M401) rotates when the output is at "High" level.
	10	Capstan Solenoid	Low	Low	Low	(High)	(High)	(High)	Low	Low	Low	Low	Low	Low	(High)	(High)	The capstan solenoid is attracted when the output is at "High" level.
	8	Forward Reel Motor	Low	Low	Low	Low	Low	Low	(High)	(High)	Low	Low	(High)	Low	Low	Low	The reel motor (M402) rotates in forward direction when the output is at "High" level.
	9	Reverse Reel Motor	Low	Low	Low	Low	Low	Low	Low	Low	(High)	(High)	Low	(High)	Low	Low	The reel motor (M402) rotates in reverse direction when the output is at "High" level.
	15	1/5 Reel Motor	High	High	High	High	High	High	High	(Low)	High	(Low)	High	High	High	High	The reel motor (M402) rotating speed decreases to 1/5 when the output is at "Low" level (besides this output, the reel motor (M402) output ("High" level) must be also needed, then.)
	11	Reel Solenoid	Low	Low	Low	Low	Low	Low	(High)	(High)	(High)	(High)	(High)	(High)	Low	Low	The reel solenoid is attracted when the output is at "High" level.
Output for the amplifier control section	13	Bias Oscillation	Low	Low	(High)	Low	(High)	(High)	Low	Low	Low	Low	Low	Low	Low	(High)	The bias oscillator starts when the output is at "High" level.
	14	Record Muting	High	High	High	High	(Low)	High	High	High	High	High	High	High	High	High	The record amplifier's muting is cancelled when the output is at "Low" level.
Output for the mechanism indicator section	17	Pause Indicator	High	(Low)	(Low)	High	High	High	High	High	High	High	High	High	High	High	The pause LED (D22) lights up when the output is at "Low" level.
	20	Play Indicator	High	High	High	(Low)	(Low)	High	High	High	High	High	High	High	High	High	The play LED (D19) lights up and the play muting is cancelled when the output is at "Low" level.
	18	Record Indicator	High	High	(Low)	High	(Low)	(Low)	High	High	High	High	High	High	High	High	The record LED (D21) lights up when the output is at "Low" level.
	19	Fast Forward Indicator	High	High	High	High	High	High	(Low)	(Low)	High	High	High	High	High	High	The fast forward LED (D20) lights up when the output is at "Low" level.
	21	Rewind Indicator	High	High	High	High	High	High	High	High	(Low)	(Low)	High	High	High	High	The rewind LED (D18) lights up when the output is at "Low" level.
	16	Auto Spacing Indicator	High	High	High	High	High	(Low)	High	High	High	High	High	High	High	High	The auto spacing LED (D23) lights up when the output is at "Low" level.
	22	APSS Forward Indicator	High	High	High	High	High	High	High	High	High	High	(Low)	High	High	High	The APSS forward LED (D17) lights up when the output is at "Low" level.
	23	APSS Reverse Indicator	High	High	High	High	High	High	High	High	High	High	High	(Low)	High	High	The APSS reverse LED (D16) lights up when the output is at "Low" level.

Notes:
1. The ( )-mark given outputs in the table are the active (effective) ones.
2. "High" in the table refers to High-level signal;
"Low", to Low-level signal.

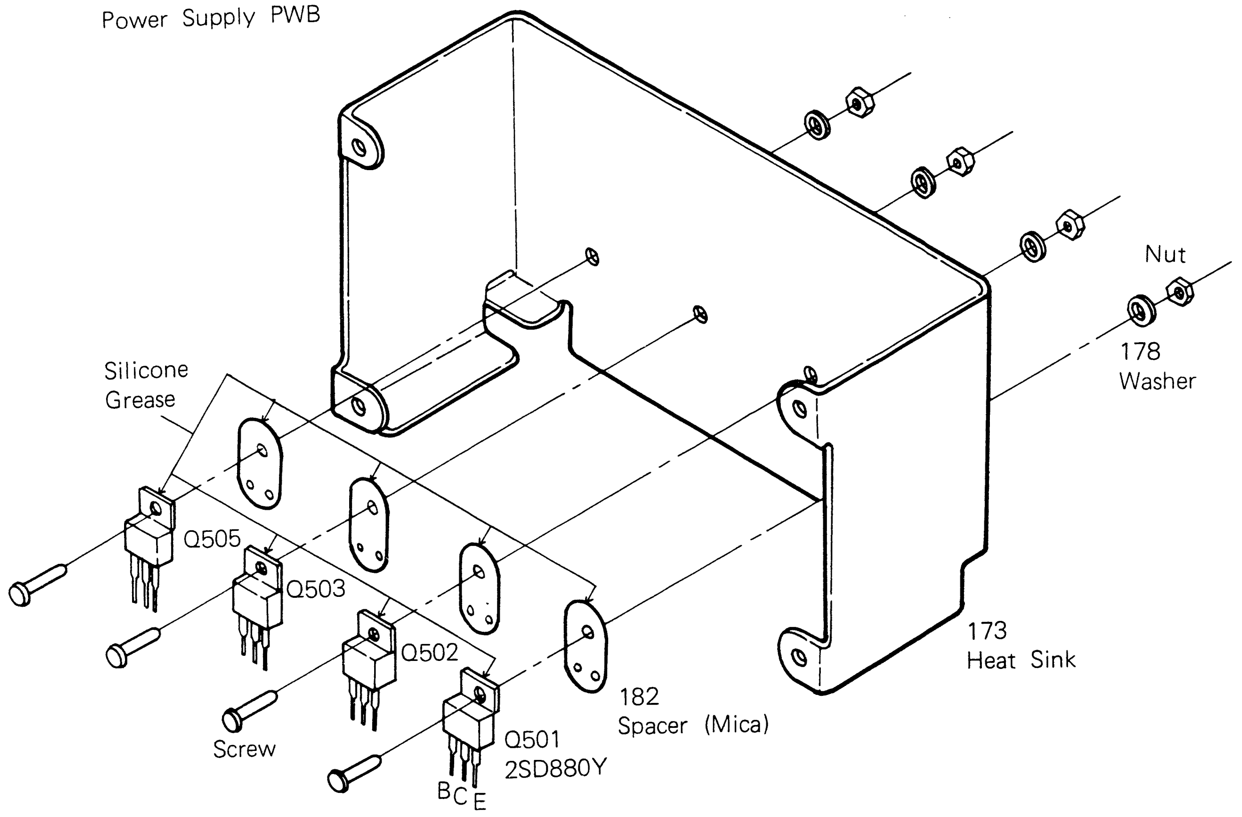
Table 45–1 OUTPUT OF INSTRUCTION DECODER

Tape Deck Operation Mode	Program Button	Tape-counter Number-input Input-set, clear	Counter-memory Number-input Input-set, clear	Direct counter-memory	Current address Number-input Input-set, clear	APMS Number-input Input-set, clear	APMS skip/check	Mechanism Control Button Auto Button Manual Button	Remarks
Power Switch "off"	Power State "off" (O48: "off")	No Operation	No Operation	No Operation	No Operation	No Operation	No Operation	No Operation	Microprocessor-controlled unit is powered off.
	Power State "on" (O48: "on")	No Operation	No Operation	No Operation	No Operation	No Operation	No Operation	No Operation	When the microprocessor-controlled unit is powered on, the contents of the memory remain as they are, though with all the LCDs lighting off.
Power Switch "on"	Cassette Holder Open (O38: "off")	○	○	○	○	○	○	No Operation	
	Stop (O38: "on")	○	○	○	○	○	○	The same as "Mechanism Control Button Operation" of Table 52–1.	
Mechanism Manual Operation Mode	Play/Pause	○	No Operation	○	No Operation	No Operation	No Operation		During the manual operation, only the LCD for the tape counter lights up but the other LCDs do not so. The manual operation independent from the microprocesser control is allowed only for the tape counter mode; the direct-memory operation is also possible with the LCD ("M") lighting up.
	Record/Pause	○	No Operation	○	No Operation	No Operation	No Operation		
	Play	○	No Operation	○	No Operation	No Operation	No Operation		
	Record/Play	○	No Operation	○	No Operation	No Operation	No Operation		
	Auto Spacing	No Operation	No Operation	No Operation	No Operation	No Operation	No Operation		
	Fast Forward	○	No Operation	○	No Operation	No Operation	No Operation		
	Rewind	○	No Operation	○	No Operation	No Operation	No Operation		
	APSS Forward	○	No Operation	○	No Operation	No Operation	No Operation		
	APSS Reverse	○	No Operation	○	No Operation	No Operation	No Operation		
Mechanism Auto Operation Mode	Tape Counter Memory	No Operation	No Operation	No Operation	No Operation	No Operation	No Operation		During the tape counter-memory auto-operation, only the LCD for the counter-memory lights up but not the other LCDs: all the buttons can't be operated manually anyway.
	APMS	No Operation *Only Display	No Operation	○	No Operation	No Operation	No memory recall is possible: the mechanism skip operation alone is allowed.		During the APMS auto operation, only the LCD for the APMS lights up but not the other LCDs. But the LCD for the tape counter can be made to light up by pushing the tape counter button in the meanwhile.

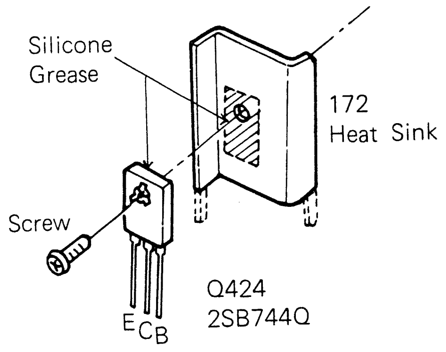
Note:
1. The operations with ○ mark are allowed.

Table 47–1 OPERATION OF PROGRAM BUTTON

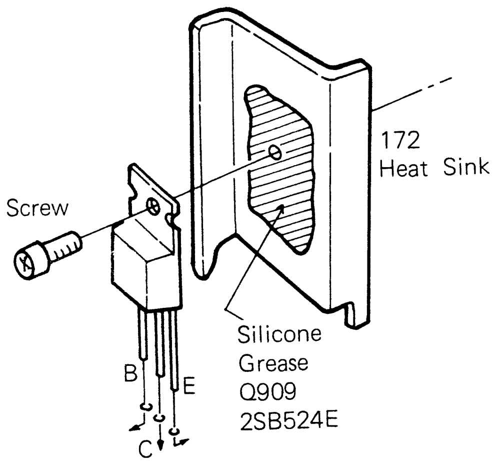
Power Supply PWB

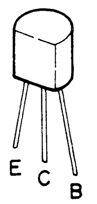

Nut
178
Washer
Silicone
Grease
Q505
Q503
Q502
Q501
2SD880Y
B C E
Screw
182
Spacer (Mica)
173
Heat Sink

Mechanism Control PWB

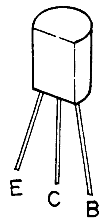

Silicone
Grease
172
Heat Sink
Screw
Q424
2SB744Q
E C B

Audio PWB


Screw
172
Heat Sink
Silicone
Grease
Q909
2SB524E
B
E
C

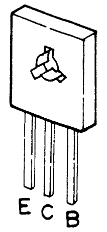


2SA733P
2SA1015Y
2SC732BTM
2SC945AP
2SC945AQ
2SC2240BL
2SA733Q
2SC1815GR

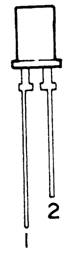


2SB562C
2SD468C

Transistor
E : Emitter
C : Collector
B : Base

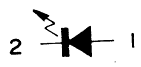


2SB744Q



* GL-9NG12 (Green)
* GL-9PR2 (Red)

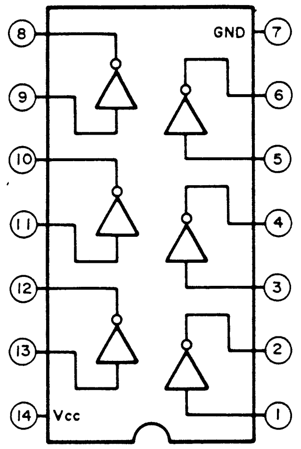
LED



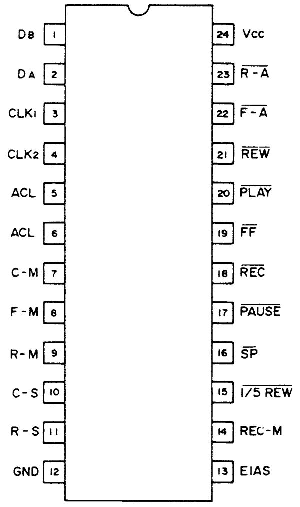
1 : Anode
2 : Cathode

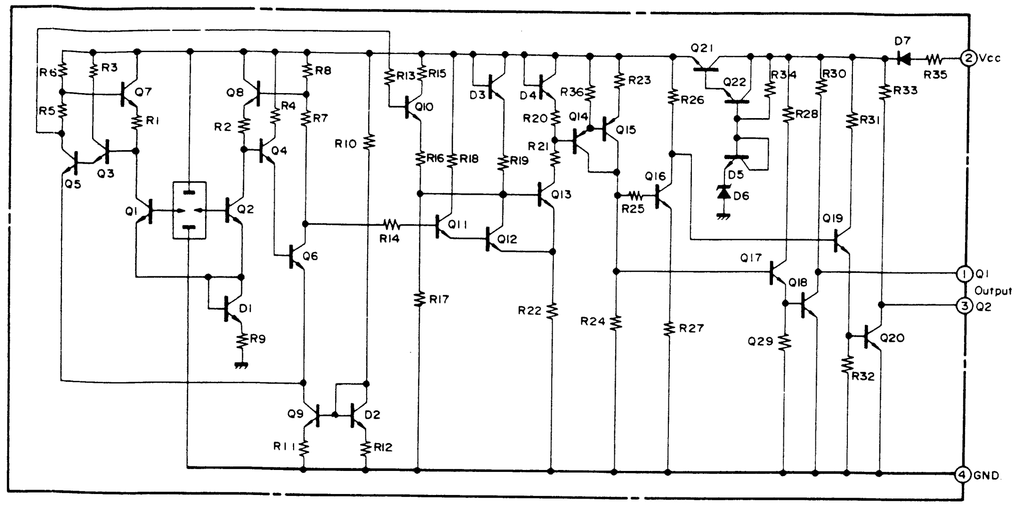
Figure 55–1 TYPES OF TRANSISTOR AND LED

IC1
RH-IX1154AFZZ
(TC4069UBP)

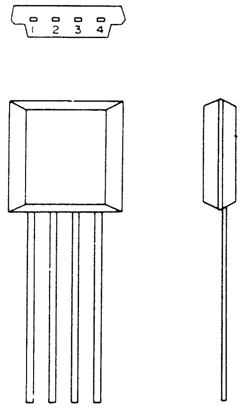

GND
8
9
10
11
12
13
14
Vcc
7
6
5
4
3
2
1

Refer to Fig. 27–1
IC2
RH-IX1161AFZZ
(M54883P)

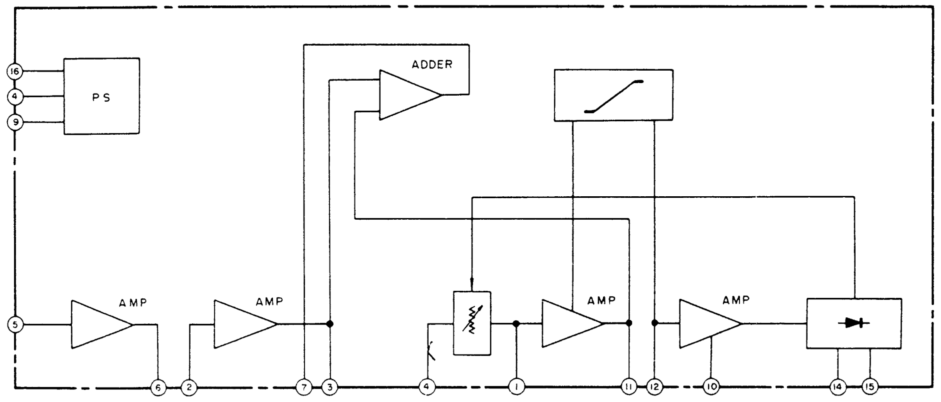

DB 1
DA 2
CLK1 3
CLK2 4
ACL 5
ACL 6
C-M 7
F-M 8
R-M 9
C-S 10
R-S 11
GND 12
24 Vcc
23 R-A
22 F-A
21 REW
20 PLAY
19 FF
18 REC
17 PAUSE
16 SP
15 1/5 REW
14 REC-M
13 EIAS

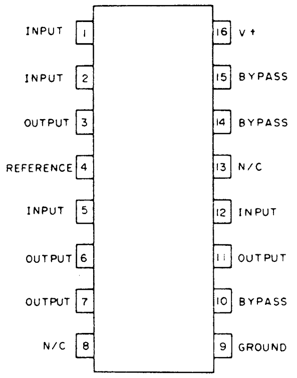

Q21
D7
R35
2 Vcc
Q22
R34
R30
R33
R6
R3
Q7
R1
R5
Q5
Q3
Q8
R8
R2
R4
R7
Q4
R10
R13
R15
Q10
D3
D4
R36
R20
Q14
R23
R26
R28
R31
R21
Q15
D5
D6
Q16
R25
R16
R18
R19
Q13
Q1
Q2
R14
Q11
Q12
Q6
Q19
Q17
Q18
1 Q1
Output
3 Q2
D1
R9
R17
R22
R24
R27
Q29
Q20
R32
Q9
D2
R11
R12
4 GND

IC401
RH-IX1075AFZZ
(DN838)

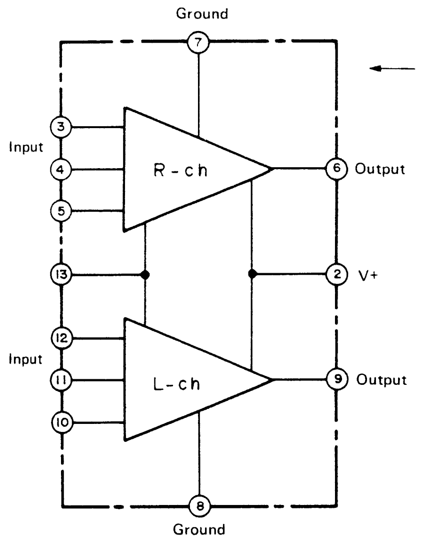


IC101, IC102
VHINE646B//-1
(NE646B)


16
4
9
PS
ADDER
5
AMP
AMP
AMP
AMP
6
2
7
3
4
1
11
12
10
14
15


INPUT 1
INPUT 2
OUTPUT 3
REFERENCE 4
INPUT 5
OUTPUT 6
OUTPUT 7
N/C 8
16 V+
15 BYPASS
14 BYPASS
13 N/C
12 INPUT
11 OUTPUT
10 BYPASS
9 GROUND

IC103
VHILA4170//-1
(LA4170)


Ground
7
Input
3
4
5
R-ch
6 Output
13
2 V+
Input
12
11
10
L-ch
9 Output
8
Ground

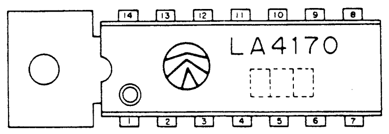
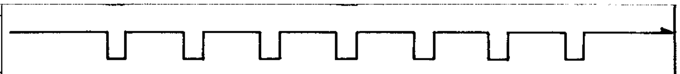
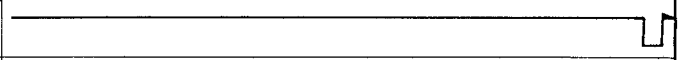
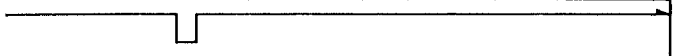
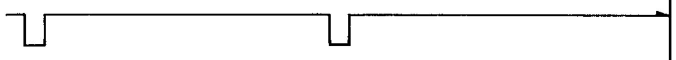
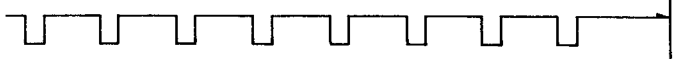
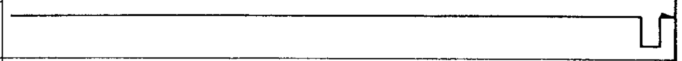
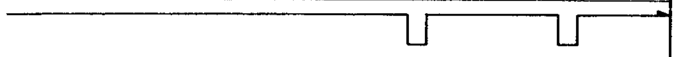
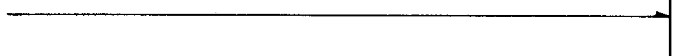
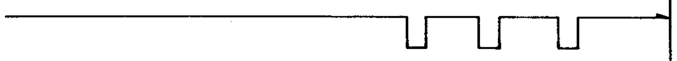
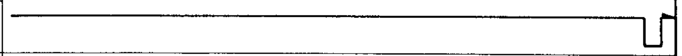
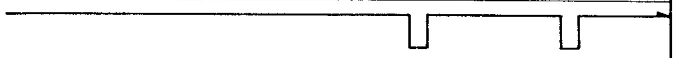
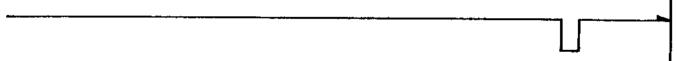
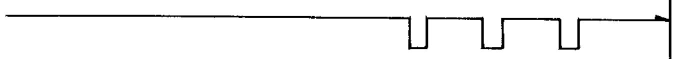
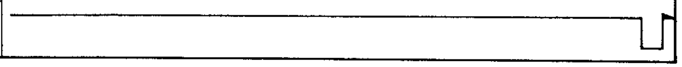

14
13
12
11
10
9
8
LA4170
1
2
3
4
5
6
7

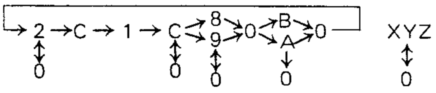
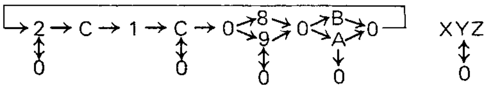
Figure 57–1 EQUIVALENT CIRCUITS AND TYPES OF IC

8	Forward	F3		0	0	0	0	0	0	0	1	
		F4		1	1	1	1	1	1	1	0	
9	APSS Reverse	F1	1	1	0	1	1	1	1	1	1	
		F2	0	1	1	1	0	1	1	1	1	
		F3	0	0	0	0	0	0	0	0	1	
		F4	1	1	1	1	1	1	1	1	0	
C	Play Muting	F1						0	1	0	1	
		F2						1	1	1	1	
		F3						0	0	0	1	
		F4						1	1	1	0	
D	Record/ Play Muting	F1						0	1	0	1	
		F2						1	1	0	1	
		F3						0	0	0	1	
		F4						1	1	1	0	

Notes:

1. F_1, F_2, F_3 and F_4 are the signals output from the microprocessor and intended for controlling the mechanism modes of the tape deck.
   F_1, F_2: Data output from the microprocessor, and to control the tape deck.
   F_3: Clock for the shift register of instruction decoder (IC2)
   F_4: Clear pulse for the shift register of instruction decoder (IC2), as well as clock for its latching.
2. In each mechanism mode, when the outputs F_1 or F_2 is at "0" level, the instructions concerned with them are developed out of the instruction decoder (IC2).

- Example:
  In the case of the mechanism mode No. 3 play, since F_1-A, F_1-C and F_2-B are all at "0" level, the instructions concerned with the capstan motor drive, capstan solenoid drive and play indicator are developed out of the instruction decoder (IC2).

utton		Remarks;
epeat	Auto-cue	
	Ⓩ 0 → Z	
⧅	⧅	
⧅	⧅	Play/pause mode is attained by pushing the pause button under play mode.
⧅	⧅	
⧅	⧅	
⧅	⧅	Record mode (record/play) is attained by pushing the record button first and next the play button. Pushing the record button alone provides record/pause mode.
⧅	⧅	Record/pause mode is attained by pushing the record button under stop mode, and also by pushing the pause button under record mode (record/play). Again, this follows the auto spacing mode.
⧅	⧅	Auto spacing mode is attained by pushing the auto spacing button under record/pause mode or record mode (record/play); but about four seconds later, it returns automatically to record/pause mode, like 7 → D → 6, during which, any mechanism control button can't be operated manually.
⧅	⧅	When the APSS forward button is pushed the program-to-grogram space detection occurs and the tape deck gets in play mode automatically, like 8 → 0 → 2 → C → 1, during which any mechanism control button except the stop button can't be operated manually.
⧅	⧅	When the APSS reverse button is pushed, the program-to-program space detection occurs and the tape deck gets in play mode automatically, like 9 → 0 → 2 → C → 1, during which any mechanism control button except the stop button can't be operated manually.
⧅	⧅	Under auto operation mode, programs of the APMS or the tape counter-memory are executed, during which any mechanism control button except the stop button can't be operated manually. APMS:  Tape Counter Memory: 
⧅	⧅	
⧅	⧅	
⧅	⧅	Mechanism modes A, B, C and D are the temporary modes which are introduced during the time from a particular mechanism control button is pushed until its designated mode has been reached. There is no button nor indicator, of course, for these modes A, B, C and D. Example: When the play button, for instance, is pushed under stop mode to attain play mode, the modes proceed as follows; 0 (Stop) → 2 (Play/Pause) → C (Play muting) → 1 (Play).
⧅	⧅	
⧅	⧅	
⧅	⧅	

Notes:

(1) The mark ○ shows that when a particular mechanism control button is pushed during manual or auto operation of the tape deck, the tape deck changes its present mode to such mode as designated by that button pushing. What mode is designated is known by the figure in the mark○.
An indication like 0 → 2 → C → 1 is to indicate what modes proceeds in the above process to attain just the designated final mode.

(2) The mark ○ → ○ shows that an automatic transfer takes place from one mechanism mode to another. What modes are designated is known by the figures in the mark ○ → ○.
Example:
When the APSS forward button, for instance, pushed under play mode ①, the tape deck gets in APSS forward mode ⑧, first, and after reaching its end, it next automatically returns to play mode ①.
That is;
① (Play) → C (Play muting) → ⑧ (APSS forward → 2 (Play/Pause) → C (Play muting) → ① (Play)

(3) The mark ⧅ shows the case where even if any one of the mechanism control buttons is pushed, this is nothing effective but the previous mechanism mode still goes on.